50th ISSUE SPECIAL

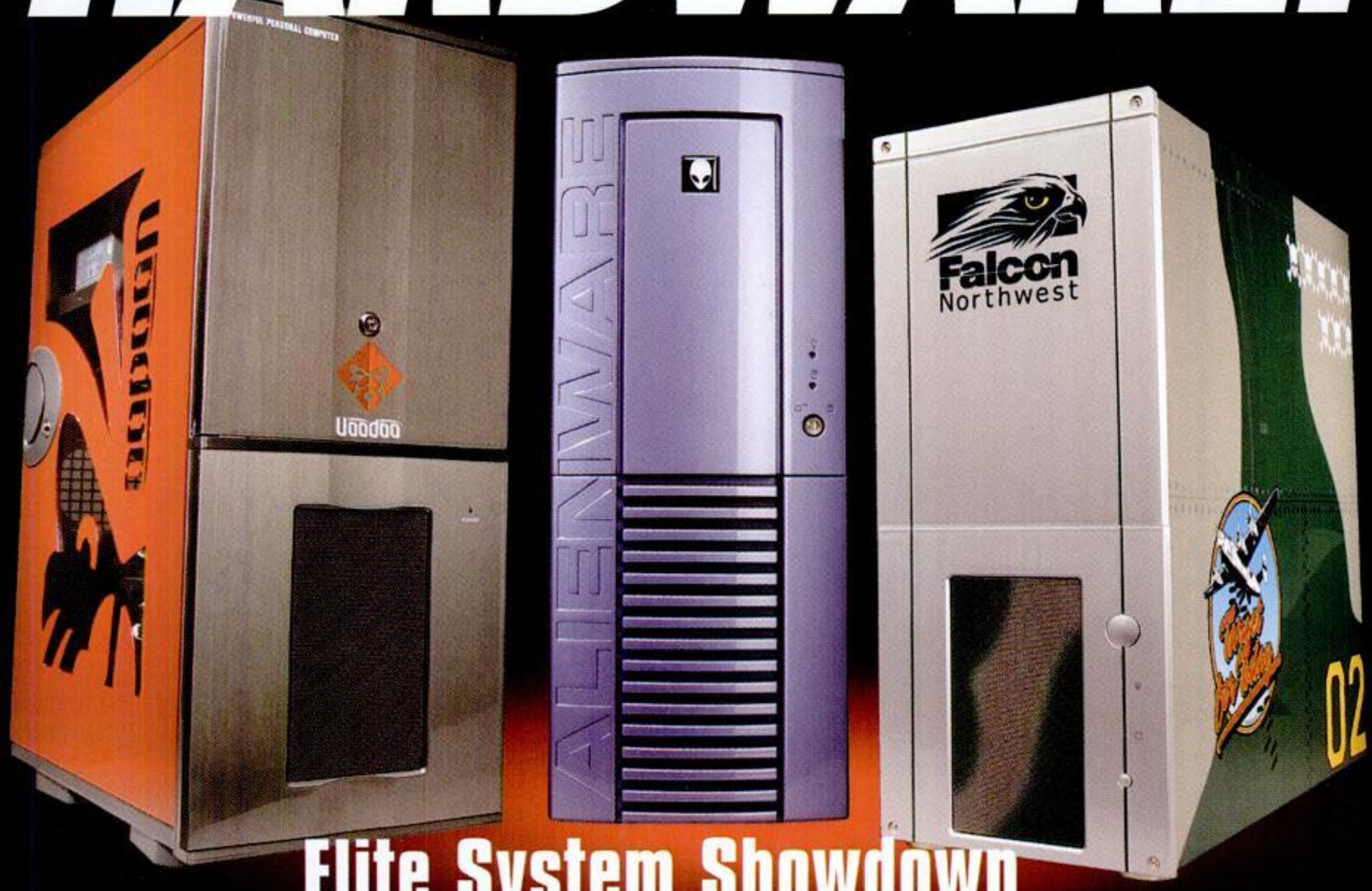
Inside: The 50 products and events that made Maximum PC the hardware hacker's bible!

MAXIMUM PC

OCTOBER 2002

MINIMUM BS

ULTIMATE GAMING HARDWARE!



Elite System Showdown

The three most spectacular gaming rigs ever. Every component detail revealed!

Videocard Grudge Match

Ten 3D cards tested to oblivion. Use our benchmarks to decide your next purchase!

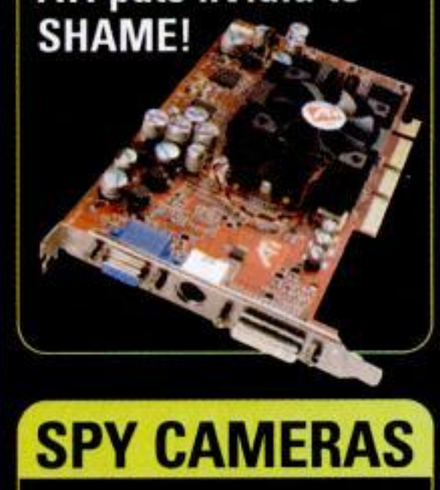
Next-Gen Game Engines

Meet the 3D games that will force your next system upgrades!

PLUS

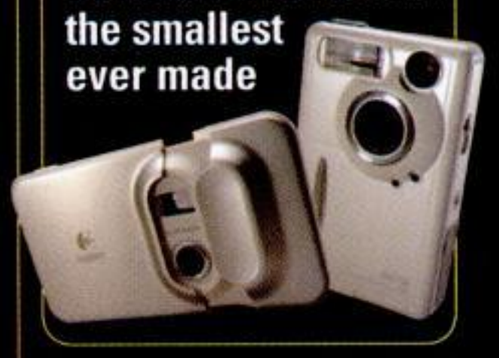
RADEON 9700

The official review: ATI puts nVidia to SHAME!



SPY CAMERAS

Teeny, tiny digital cameras: We review the smallest ever made



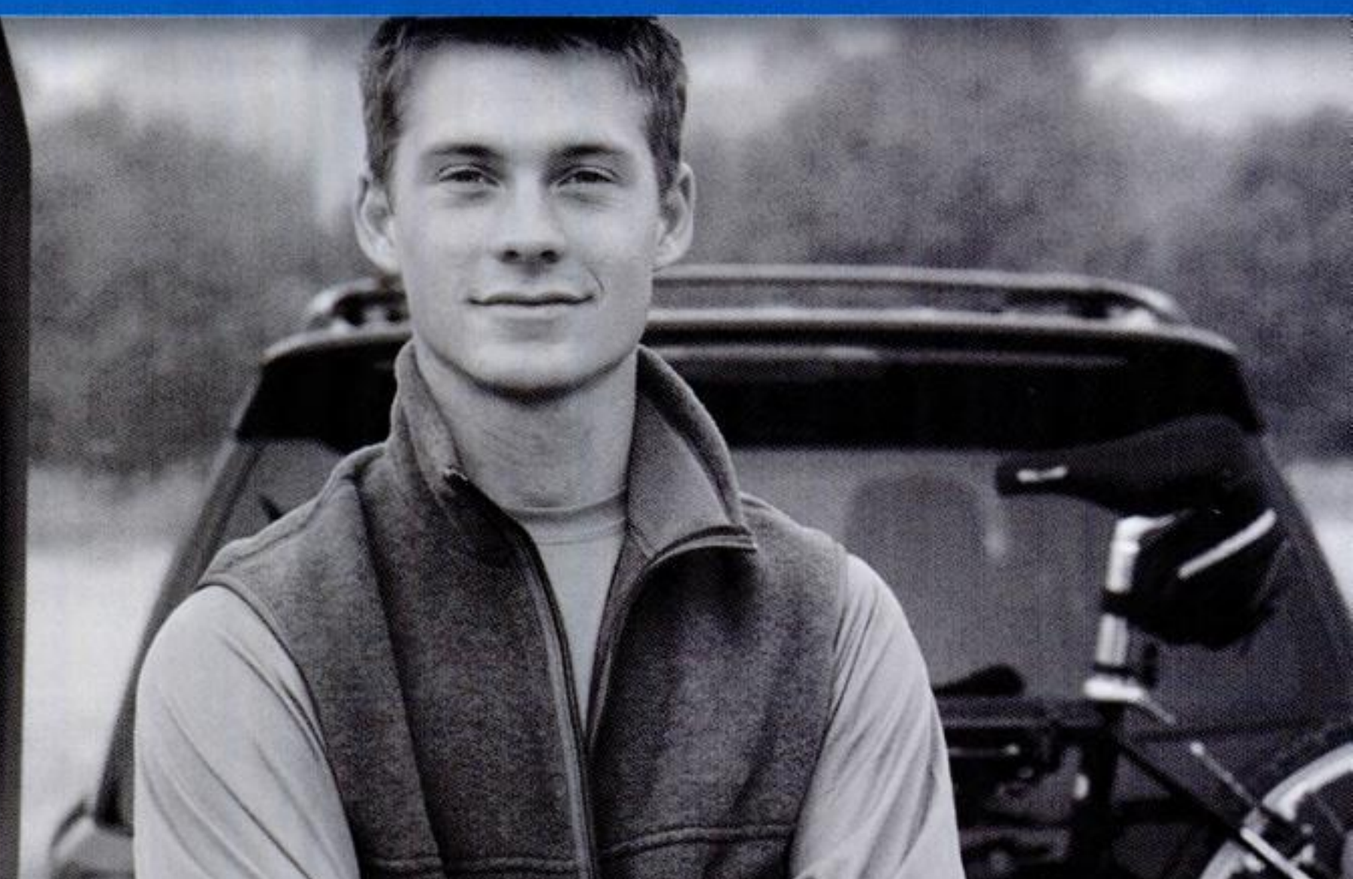
SAMSUNG COMBO 32X

It burns CDs, it reads DVDs. It's the only combo drive worth buying

imagine MEDIA
$7.99US $9.99CAN
10
0 74470 03353 0

Copyrighted material

Speed, power and performance in an affordable PC.
Have your cake and eat it too.



Select Dell desktops feature high performance Intel® Pentium® 4 Processors.

Dell | Home Notebooks

Inspiron™ 2650 Notebook

Mobile Power, Great Price

- Mobile Intel® Pentium® 4 Processor-M at 1.70GHz
- 14.1" XGA TFT Display
- 256MB DDR PC2100 SDRAM
- 30GB* Ultra ATA Hard Drive
- 8x Max DVD-ROM Drive
- 16MB DDR NVIDIA® GeForce2 Go™ 100 AGP 4x Graphics
- Sound Blaster® Compatible
- 59WHr Li-Ion Battery (8 cell)
- Internal Modem and Network Card
- Microsoft® Windows® XP Home Edition, Microsoft® Works Suite 2002

$1479 or as low as **$45**/mo.*
E-VALUE Code: 13166-800914m

Make this your perfect PC:

- 15" XGA TFT Display, add $100
- 24x CD-RW/DVD Combination Drive, add $170
- 32MB DDR NVIDIA® GeForce2 Go™ 100 AGP 4x Graphics, add $179
- Dell TrueMobile* 1150 Wireless PC Card, add $99

Inspiron™ 2650 Notebook

Mainstream Performance for the Demanding Mobile User

- Mobile Intel® Pentium® 4 Processor-M at 1.80GHz
- 14.1" XGA TFT Display
- 256MB DDR PC2100 SDRAM
- 20GB* Ultra ATA Hard Drive
- 24x CD-RW/DVD-ROM Combination Drive with Roxio's Easy CD Creator®
- 32MB DDR NVIDIA® GeForce2 Go™ 100 AGP 4x Graphics
- Sound Blaster® Compatible Sound with Wavetable
- 59WHr Li-Ion Battery (8 cell)
- Internal Modem and Network Card
- Microsoft® Windows® XP Home Edition, Microsoft® Works Suite 2002

$1779 or as low as **$54**/mo.*
E-VALUE Code: 13166-800917n

Make this your perfect PC:

- 384MB DDR PC2100 SDRAM, add $200
- Microsoft® Office XP Small Business, add $129
- 30GB* Hard Drive, add $99
- Custom Leather Case, add $99

Inspiron™ 8200 Notebook

Ultimate Mobile Multimedia Performance

- Mobile Intel® Pentium® 4 Processor-M at 1.80GHz
- 15" Super XGA+ TFT Display
- 384MB DDR PC2100 SDRAM
- 30GB* Ultra ATA Hard Drive
- 24x CD-RW/DVD Combination Drive with Roxio's Easy CD Creator®
- 64MB DDR NVIDIA® GeForce4 440 Go™ AGP 4x Graphics
- Sound Blaster® Compatible Sound with Wavetable
- 66WHr Li-Ion Battery with ExpressCharge™ Technology (8 cell)
- Internal Modem and Network Card
- Microsoft® Windows® XP Home Edition, Microsoft® Works Suite 2002

$2189 or as low as **$66**/mo.*
E-VALUE Code: 13166-800921m

Make this your perfect PC:

- Mobile Intel® Pentium® 4 Processor-M at 2GHz, add $150
- Advanced Port Replicator Bundle with Keyboard, Mouse, Monitor Stand, add $229
- Extra Li-Ion Battery, add $99
- Notebook Backpack, add $79

Dell recommends Microsoft® Windows® XP Professional for Mobile Computing

***AOL: New members only. Must register for AOL within 30 days of invoice. To avoid paying monthly membership fees, cancel during the 6-month promotional period. Even during promo period, telephone access charges on your phone bill (call your phone co. for details) and surcharges for premium services and 800# access may apply, including in AK. Availability may be limited, especially during peak times.** For new, 18+ U.S. members with major credit card or checking account only. Limited time offer.

Pricing/Availability: Prices, specifications, availability and terms of offers may change without notice. Taxes and shipping charges are extra, and vary. Cannot be combined with other offers or discounts. Valid for U.S. Dell Home Systems Co. new purchases only. Dell cannot be responsible for errors in typography or photography. **Limited Warranties:** You can get a copy of our limited warranties and guarantees by writing Dell USA LP, Attn: Warranties, One Dell Way, Round Rock, TX 78682. To purchase warranty only or for information on other service options please call 1-800-915-3355 or visit dell4me.com/termsandconditions. **Service:** At-Home or On-Site service provided via third-party contract with customer. Technician will be dispatched, if necessary, following phone-based troubleshooting. Availability varies. Other conditions apply. **Hard Drives:** For hard drives, GB means 1 billion bytes; accessible capacity varies with operating environment. **56K**

Copyrighted material

Dell | Home Desktops

Dimension™ 4500 Desktop

Essential Performance, Great Price

- Intel® Pentium® 4 Processor at 2GHz with 512K L2 Cache
- 128MB DDR SDRAM at 266MHz
- 40GB* Ultra ATA/100 Hard Drive (7200 RPM)
- NEW 17" (16.0" v.i.s., .27dp) E772 Monitor
- 32MB ATI® RAGE™ Ultra Graphics Card
- 16x Max DVD-ROM Drive
- Integrated Audio
- NEW Harman Kardon HK-206 Speakers
- 56K* PCI Telephony Modem
- Microsoft® Windows® XP Home Edition, Microsoft® Works Suite 2002

$899 or as low as **$27**/mo.*
E-VALUE Code: 13166-500908m

Make this your perfect PC:

- 256MB DDR SDRAM at 266MHz, add $50
- 24x/10x/40x CD-RW Drive with Roxio's Easy CD Creator®, add $20
- SB Live! 1024V Digital Sound Card, add $20

Dimension™ 4500 Desktop

Superior Performance, Smart Value

- Intel® Pentium® 4 Processor at 2.40GHz with 512K L2 Cache
- 256MB DDR SDRAM at 266MHz
- 40GB* Ultra ATA/100 Hard Drive (7200 RPM)
- 17" (16.0" v.i.s., .25dp) M782 Flat Screen Monitor
- NEW 64MB DDR NVIDIA® GeForce4 MX™ Graphics Card with TV-Out
- 16x Max DVD-ROM Drive
- 24x/10x/40x CD-RW Drive with Roxio's Easy CD Creator® (2nd bay)
- SB Live! 1024V Digital Sound Card
- Harman Kardon HK-395 Speakers with Subwoofer
- 56K* PCI Telephony Modem
- 10/100 PCI Fast Ethernet Network Card
- Microsoft® Windows® XP Home Edition, Microsoft® Works Suite 2002

$1199 or as low as **$36**/mo.*
E-VALUE Code: 13166-500911m

Make this your perfect PC:

- 80GB* Ultra ATA/100 Hard Drive (7200 RPM), add $60
- 15" E151FP Flat Panel Display, add $220
- Harman Kardon HK-695 Surround Sound Speakers with Subwoofer, add $30
- Turtle Beach™ Santa Cruz™ DSP Sound Card, add $40

Dimension™ 8200 Desktop

Cutting Edge Technology

- Intel® Pentium® 4 Processor at 2.53GHz with 533MHz System Bus
- 256MB RDRAM
- 80GB* Ultra ATA/100 Hard Drive (7200 RPM)
- NEW 19" (18.0" v.i.s., .26dp) M992 Flat Screen Monitor
- NEW 64MB DDR NVIDIA® GeForce4 Ti 4200 Graphics Card with TV-Out and DVI
- 16x Max DVD-ROM Drive
- 40x/10x/40x CD-RW Drive with Roxio's Easy CD Creator® (2nd bay)
- Turtle Beach™ Santa Cruz™ DSP Sound Card
- Harman Kardon HK-695 Surround Sound Speakers with Subwoofer
- 56K* PCI Telephony Modem
- 10/100 PCI Fast Ethernet Network Card
- Microsoft® Windows® XP Home Edition, Microsoft® Works Suite 2002

$1599 or as low as **$48**/mo.*
E-VALUE Code: 13166-500915m

Make this your perfect PC:

- 512MB RDRAM, add $140
- 17" 1702FP Dell UltraSharp™ Digital Flat Panel Display, add $500
- NEW DVD+RW/+R* Drive with CD-RW including Roxio's Easy CD Creator® and Sonic™ MyDVD™, add $299
- NEW 128MB ATI® RADEON™ 9700 Pro Graphics Card with TV-Out and DVI, add $290

Dell | Standard Features

Standard Features

- Dell Picture Studio Image Expert Standard Edition
- Dell Jukebox powered by MUSICMATCH®
- 6 Months America Online® Membership Included*
- Dimension Desktops shown here include 1-Year Limited Warranty*, 1-Year At-Home Service*, Keyboard and Mouse
- Inspiron Notebooks shown here include 1-Year Limited Warranty*, 1-Year Mail-In Service

Dell | Solutions

Software & Peripherals

Desktop

- Epson® Stylus C80 Color Printer (Color-Matched to System), $149
- Lexmark™ X85 Multi-Function (Prints, Scans, and Copies), $199
- Belkin® SurgeMaster™ Maximum Series Surge Protector, $49
- Kodak® CX4230, $249

Notebook

- Tripp-Lite Portable Surge Protector, $20
- Targus® Auto/Air Adapter, $99
- Kensington® SaddleBag, $46
- Kensington® Slim MicroSaver® Security Cable, $37
- Canon® BJC-85 Portable Printer, $299

Service & Support

Upgrade from Standard Warranty and Service to:

3-Year Limited Warranty*, 3-Year At-Home Service*:

- Dimension 4500 and 8200, $159

3-Year Limited Warranty*, 3-Year On-Site Service*:

- Inspiron 2650, $199
- Inspiron 8200, $299

Accidents Happen!

Protect yourself with CompleteCare™ Accidental Damage Protection*:

- Dimension 1-Year, $39
- Dimension 3-Year, $99
- Inspiron 1-Year, $79
- Inspiron 3-Year, $149

With Dell, you can have it all. Looking for the latest in PC technology? Look no further than Dell. Featuring high performance Intel® Pentium® 4 Processors, Dell PCs deliver exceptional speed and performance to any application. Whether you need a versatile desktop that's ready for anything, or a powerhouse notebook for when you're out and about, Dell can custom-build a PC that's just right for you. And since it's made to order and shipped direct, a new Dell PC is always available at a price that's right for you, too. There truly is a better way of finding, buying, and owning a computer. A better way that's easy.

intel inside pentium 4

The perfect PC, at the perfect price. Easy as DELL™

To order visit **www.dell4me.com/maxpc** or call toll free **1-800-247-2063.**

Modem: Download speeds limited to 53Kbps. Upload speeds are less (about 30Kbps) and vary by modem manufacturer and line conditions. Analog phone line and compatible service required. **PURCHASE PLAN:** Dell Preferred Account: Offered by CIT OnLine Bank to qualified U.S. residents. Taxes and shipping charges are extra and vary. **TrueMobile:** Connect at rate of 11Mbps up to 100m from connected access point. Range and speed may vary due to number of users, interference, transmission barriers (such as walls and building material) and other factors. **CompleteCare:** CompleteCare service excludes theft, loss, and damage due to fire or intentional damage. CompleteCare is currently not available in all states. Not available for Dell Home Sales customers in CA, FL or NY. Not available for Employee Purchase Program customers (Government, Health Care and Relationship/Faculty, Staff and Students) in CA or FL. May not be available to all customers. For complete details, visit http://www.dell.com/us/en/gen/services/service_service_contracts.htm. **DVD+RW/+R Drives:** Discs burned with this drive may not be compatible with some existing drives and players; using DVD+R media provides maximum compatibility. **Trademarks/Copyright Notices:** Intel, Intel Inside, Pentium and Celeron are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation. America Online, AOL, the Triangle logo and Buddy List are registered service marks of America Online, Inc. ©2002 Dell Computer Corporation. All rights reserved.

E-VALUE™

Keep your E-VALUE CODE handy! It's the easiest way to find and build your perfect PC when you decide to order.

Copyrighted material

TDK®

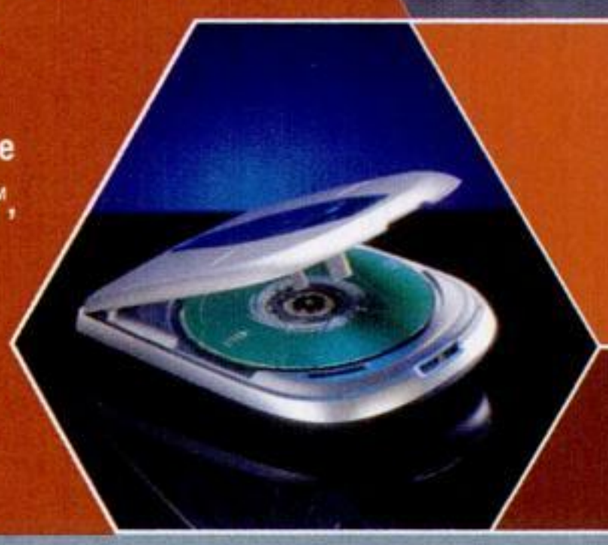
velocd™

USB 2.0

OPEN EXCHANGE

With the ultra-fast portable USB 2.0 veloCD, you're always open to sharing ideas. Built for performance and flexibility, veloCD 24/10/40 burns a complete CD-R in just 4 minutes. It's the transportable solution that brings high-speed recording to all PC computers. Anywhere you need it. No sliding drawers. No hassle.

Free your ideas at the Digital Sweetspot™, www.tdk.com.



FULL MULTITASKING CAPABILITY BUFFER Underrun PROTECTION

HI-SPEED CERTIFIED USB

veloCD is a registered trademark of TDK Electronics Corporation.
The USB-IF logo is a trademark of Universal Serial Bus Implementers Forum, Inc.
All other brands and products are trademarks of their respective holders

Release Notes

What Megahertz Myth?

Last month, a cadre of PC users filed a class-action lawsuit against Intel. The plaintiffs claim that Intel deceived the public in its marketing of the Pentium 4, and argue that the CPU actually provides less pure performance than the P-III and AMD Athlon. Coincidentally, the suit began making news just days after AMD launched its own PR campaign against the "megahertz myth." AMD's basic premise is that Intel's clock speed advantage doesn't necessarily beget superior real-world performance.

Personally, I think the Athlon is a marvel of processing efficiency. If I didn't, I would never have supported our staff's decision to name the Athlon "CPU of the Year" in 1999, 2000, and 2001. But I find the AMD megahertz myth campaign to be a bit pathetic, and the anti-P4 lawsuit entirely ludicrous.

For better or for worse, unfettered marketing is the American way. We live in a capitalist society where companies are allowed to spin their wares, just as long as they don't harm the body politic or falsify performance claims. Numerous real-world benchmarks prove the P4 is faster than the P-III and Athlon in various applications, so the lawsuit amounts to nothing more than a silly publicity stunt. On who's behalf, one must wonder. Bottom line: If P4 haters had any sense at all, they'd limit their campaign to disputing the benchmarks that Intel uses to trump its CPU. At least that tack could be taken halfway seriously.

I don't think anyone would disagree that as a pure processing engine, the Athlon has traditionally squeezed more performance from each clock cycle than has the P4. But the P4 story has always been about sheer horsepower. The P4 offers so much clock speed, it's able to easily rise above the relative inefficiency of its core.

There are three different ways to posit the CPU performance question, and each is valid in its own right:

(1) When running at identical clock speeds, which CPU offers more raw performance? (2) Based purely on pricing comparisons, which CPU offers the most performance for total dollars spent? (3) Which company is currently selling the best-performing CPU, prices and clock speed be damned?

Maximum PC has always been most concerned with the third question, because our readers are mostly interested in raw benchmark-busting performance. But we expect to see very compelling silicon from AMD in the next few weeks, and who knows, maybe the company will leapfrog over Intel once again. We'll do our best to craft the right evaluation criteria for each of the three performance questions.

Let me leave you with this: If megahertz doesn't matter, then why do CPU companies even bother releasing faster versions of the same core? No need to answer, but I think we can now go forward in agreement that clock speed does matter, indeed.

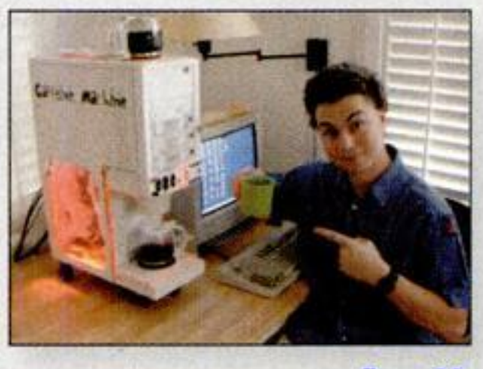
—JON PHILLIPS

Contents

10.02

Page 12

Page 18



Page 96

REGULARS

06 In/Out
Your questions, our answers... and then some.

12 Quick Start
PC previews, news, factoids... and a flurry of activity in the budget videocard arena.

18 Head2Head
Two itty-bitty digital cameras offer 1.3 megapixel resolution and the the chance to feel like a spy. Which one's more bitchin'?

20 WatchDog
Beware the contents of your shrinkwraped packages; forget about turning to Elsa for help; and Toshiba laptop lockups lead to lawsuit (say *that* 10 times fast.)

58 Ask the Doctor
This month: Adjusting the font size in *Internet Explorer*, removing all traces of an unwanted app; and learning to appreciate the ol' popup dialogue box.

61 How To...
Unravel the chaos inside your case by learning a thing or two about wise wiring.

96 Rig of the Month
After seeing this month's case modification, you might wonder as we did: What's next, a computer that also serves as a Crockpot?

REVIEWS

68 ATI Radeon 9700 Pro videocard

69 Pocketec Pockey 20GB external hard drive

70 Shuttle SS51 mini-system

71 Samsung Combo 32x CD-RW & DVD-ROM

72 e.Digital Treo 15GB MP3 player

72 Creative Labs 128MB Nomad MuVo

74 Lego Spybotics

76 Photoshop Elements 2.0

Page 74

Page 72

Page 70

Copyrighted material

I used to hear my PC –

Now I Listen to it with

Sound BLASTER 24-bit 96kHz / 100dB SNR

Sound Blaster® 24-bit audio transforms your PC to a high-end Home Theater System

Once you've introduced your ears to the unsurpassed music fidelity of genuine Sound Blaster® 24-bit audio, you'll never go back to ordinary 16-bit PC sound again! Using multiple high quality 24-bit/96kHz DACs (digital-to-analog converters), Sound Blaster® 24-bit audio delivers pristine clarity of 100dB SNR (Signal to Noise Ratio) rivaling high-end home theater systems. With a broad frequency response and dynamic range, Sound Blaster® 24-bit audio produces the softest signals with the most clarity and the loudest signals with the most intensity. This adds life and depth to your CDs, MP3s, DVD movies, and games.

Upgrade to either the internal Sound Blaster® Audigy™ or the external Sound Blaster® Extigy™ and start enjoying genuine Sound Blaster® 24-bit high fidelity audio — never before possible with ordinary PC audio.

Sound BLASTER AUDIGY™ Sound BLASTER Extigy™ CREATIVE®

©2002 Creative Technology Ltd. The Creative logo is a registered trademark of Creative Technology Ltd. in the United States and/or other countries. All brands or product names listed are trademarks or registered trademarks and are property of their respective holders.

Copyrighted material

MAXIMUM PC

EDITORIAL
Jon Phillips EDITOR-IN-CHIEF
Katherine Stevenson MANAGING EDITOR
Gordon Mah Ung SENIOR EDITOR
Will Smith TECHNICAL EDITOR
Logan Decker FEATURES EDITOR
Greg Vederman DISC EDITOR
Andrew Sanchez EDITOR EMERITUS

ART
Natalie Jeday ART DIRECTOR
Monique Martinez ASSOCIATE ART DIRECTOR
Mark Madeo PHOTO EDITOR

CONTRIBUTING EDITORS
Omeed Chandra, Tom Halfhill, Brian Lam, Thomas McDonald, Johnathan McKinny

CONTRIBUTING WRITERS
Brad Dosland

PRODUCTION
Richard Lesovoy PRODUCTION DIRECTOR
Lawrence Briseno PRODUCTION COORDINATOR

ADVERTISING
Chris Coelho PUBLISHER
Bernard Lanigan EASTERN ADVERTISING DIRECTOR
Dave Lynn WESTERN ADVERTISING DIRECTOR
Mary LaChapelle MARKETING DIRECTOR
Sharon Kiernan MARKETPLACE MANAGER
Alison McCreery SENIOR MARKETING MANAGER
Jose Urrutia SALES COORDINATOR

CIRCULATION
Tina K. Rodich GROUP CIRCULATION DIRECTOR
Joan Braunstein NEW BUSINESS DIRECTOR
Mimi Hall NEWSSTAND MANAGER
Janet Amistoso DIRECT MARKETING SPECIALIST

REPRINTS PRINT AND DIGITAL
Reprint Management Services
717.399.1900

How to contact us:
All subscription Inquiries 800.274.3421 or maxcustserv@cdsfulfillment.com
Editorial staff input@maximumpc.com

imagine

IMAGINE MEDIA, INC.
150 North Hill Dr. Brisbane, CA 94005
(415) 468-4684 www.imaginemedia.com

CHIEF EXECUTIVE Greg Ingham
PRESIDENT Jonathan Simpson-Bint
VICE PRESIDENT/CFO Tom Valentino
VP/EDITORIAL DIRECTOR Matt Firme
VICE PRESIDENT/CIRCULATION Holly Klingel
VICE PRES/HUMAN RESOURCES Steve Leibman
GENERAL COUNSEL Charles Schug
DIR. OF CENTRAL SERVICES Nancy Durlester

Imagine Media is aimed at people who have a passion. A passion for games. For business. For computers. Or for the Internet. These are passions we share. Our goal is to feed your passion with the greatest magazines, web sites, and CD-ROMs imaginable. We love to innovate, we love to have fun, and we have a cast-iron rule always to deliver spectacular editorial value. That means doing whatever it takes to give you the information you need. With any luck, we'll even make you smile sometimes. Thanks for joining us.

the future network

Media with passion

Imagine Media Inc is part of The Future Network plc. The Future Network plc serves the information needs of groups of people who share a passion. We aim to satisfy their passion by creating magazines and web sites that offer superb value for money, trustworthy information, multiple ways to save time and money, and are a pleasure to read or visit. This simple strategy has helped create one of the fastest-growing media companies in the world: we publish more than 100 magazines, 20 magazine web sites, and a number of web networks from offices in five countries. The company also licenses 42 magazines in 30 countries. The Future Network is a public company quoted on the London Stock Exchange (symbol: FNET).

BATH LONDON MILAN MUNICH NEW YORK PARIS SAN FRANCISCO

Contents

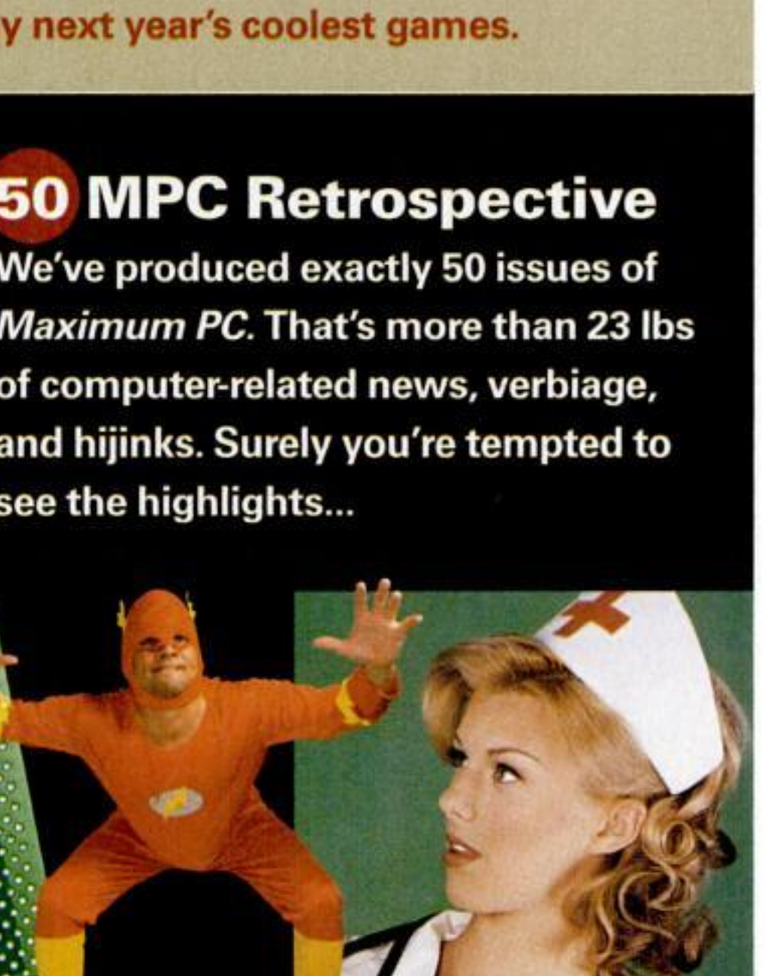
OCTOBER FEATURES

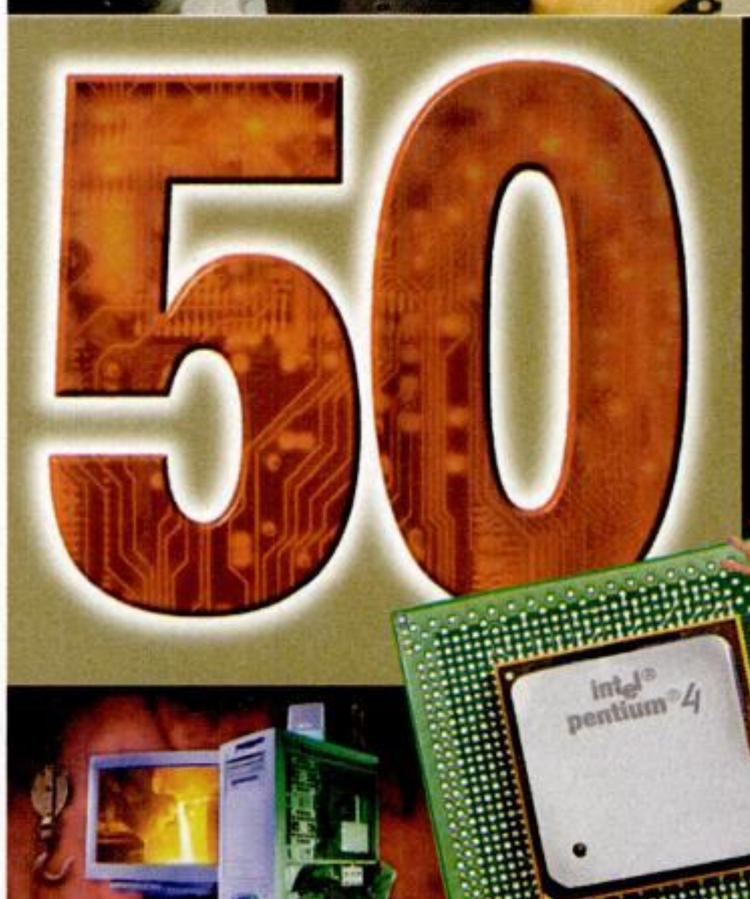
27 Game Rigs
All three contestants are brawny and beautiful, but which is the best of the "boutique" gaming systems?

37 3D Grudge Match
We benchmark the crap out of every relevant 3D chip currently on the market. Don't buy your next videocard without checking our scores!

42 Next-Gen 3D Engines
Meet the rendering tricks that will bring your videocard to its knees! Amazing bump maps, shadows, and lighting will force you to upgrade if you want to play next year's coolest games.

50 MPC Retrospective
We've produced exactly 50 issues of *Maximum PC*. That's more than 23 lbs of computer-related news, verbiage, and hijinks. Surely you're tempted to see the highlights...





MAXIMUM PC (ISSN 1522-4279) is published monthly by Imagine Media Inc., 150 North Hill Drive, Suite 40, Brisbane, CA 94005, USA. Periodical class postage paid in Brisbane, CA, and at additional mailing offices. Newsstand distribution is handled by Curtis Circulation Company. Basic subscription rates: one year (12 issues) US: $20; Canada: $34; Foreign: $44. Basic subscription rates "Deluxe" version (w/CD): one year (12 issues/12 CD-ROMs) U.S.: $30; Canada: $44; Foreign $54. US funds only. Canadian price includes postage and GST (GST#R128220688). Postmaster: Send changes of address to Maximum PC, P.O.Box 51479, Boulder, CO 80328-1479. Standard Mail enclosed in the following edition: B. Ride-Along enclosed in the following editions: C, C1, C2, C3. Int'l Pub Mail# 0781029. Outside the U.S. and Canada, price is $53.95, U.S. prepaid funds only. For customer service, write Maximum PC, P.O. Box 51479, Boulder, CO 80328-1479; Maximum PC, 150 North Hill Drive, Brisbane, CA 94005. Imagine Media also publishes PC Gamer, Next Generation, MacAddict, Official Xbox.

Entire contents copyright 2001, Imagine Media Inc. All rights reserved. Reproduction in whole or in part is prohibited. Imagine Media Inc. is not affiliated with the companies or products covered in Maximum PC. PRODUCED AND PRINTED IN THE UNITED STATES OF AMERICA.

Copyrighted material

In/Out

You write, we respond

Take That, Matrox!

It was interesting to see your article on Matrox's new Parhelia [July 2002]. I'll probably upgrade to it if they come out with a PCI version, since motherboards have just one AGP slot. For the setup you see here, I use a Matrox G550 AGP card and four Matrox G450 PCI cards. The monitors are a mixture of NEC and Mitsubishi, with a Dell on the side—two 22-inch, six 21-inch, and one 20-inch, respectively. I mainly use the system for business applications. I've tried to do multi-head gaming, but most of the games I've tried just focus on the main monitor and won't run spread out across all nine.

—MIKE KNUDSEN

EDITOR-IN-CHIEF JON PHILLIPS REPLIES: See, everybody, the crazy guy who installed the 15-inch LCD panel in the dashboard of his Mustang [Rig of the Month, June 2002] does in fact have a "more sensible" side. Or at least his daughter might think so. We still think he's nuts!

BOOMER, JOE, SAMSUNG, AND HOPE

We saw the picture of Samsung executives with Boomer Esiason and Joe Torre [In/Out, August 2002] and thought your readers might want to learn more about a great charity that's helping kids and families in need. Samsung's Four Seasons Of Hope is raising funds and awareness for four worthy charities headed up by four of our nation's best-known sports stars: the Joe Torre Family Foundation (for abused women and children), the Boomer Esiason Foundation (for Cystic Fibrosis), the Magic Johnson Foundation (for unfortunate inner city kids), and the Arnold Palmer Hospital for Children & Women. These causes help millions of Americans each day, and we invite your readers to participate in any way they can. More information is available at **www.fourseasonsofhope.com.** Thank you for helping us get the word out!

—PETER WEEDFALD, SAMSUNG ELECTRONICS AMERICA

"Next time you want to 'advise' someone... run the suggestion by somebody who has a bit of real-life field experience."

A REPRIMAND FROM CORPORATE AMERICA

Regarding "Clean Start," August 2002: About the only thing I can think of that's worse for the credibility of a publication that claims to have "minimum BS" is a wholesale advocacy of repeated, frequent hard drive reformatting! Anyone who does not realize the inherent dangers your "solution" causes—the inevitable files missed during back up; the possibility of missing drivers that cannot be re-downloaded for any of a dozen reasons; the potential for a critical system malfunction in the rebuild process; the virtual impossibility of "tweaking" any reinstalled program exactly the way it was before it was uninstalled—is seriously misguided.

The frightening thing is, anyone with the technical know-how to actually follow your "10 Steps to a Gleaming Fresh OS" without totally debilitating his or her system is too experienced to do something so foolish and ill-conceived in the first place. Therefore, the only people likely to listen to your possibly well-meant but misguided advice are those who definitely should never be left alone with their computers. Next time you want to "advise" someone on how to "clean up" his or her OS, run the suggestion by somebody who has a bit of real-life field experience—obviously nothing in great abundance on your editorial review board.

—AMY M. HALPERIN, IT MANAGER

EDITOR-IN-CHIEF JON PHILLIPS REPLIES: What we have here is a vivid illustration of the divide between corporate computing and home enthusiast computing. In the world that IT Manager Halperin inhabits, computer users are pathetic know-nothings who must be stopped from causing catastrophe ("Don't touch the Delete key! That document is a peaceful document—it has no weapons!"). Meanwhile, in the world *we* inhabit, computer users are empowered, emboldened, and educated. We know the risks, and

CUT, COPY, PASTE

➤ **The Dream Machine's *3DMark* score was 71.5, not 31.1, as was misreported in the September issue.**

➤ **In our review of the Hypersonic Sonic Boom (September 2002), we mistakenly stated that the videocard fans blow away from the card, when they in fact blow toward the card. However, our real complaint was that the fans are positioned too close to the case side panel, which has no ventilation holes to draw in cool air. Thus, we still take issue with the Sonic Boom's cooling setup.**

Copyrighted material

RADEON™ 9700 PRO

9700 PRO

MADE WITH NO LIMITS IN MIND

It's totally lethal. The amazing RADEON™ 9700 PRO is the **fastest board** powered by ATI's VPU technology, delivering the ultimate 3D gaming experience. It's the **first to provide 8 pipelines** for twice the rendering power. The **first to fully support DirectX® 9.0**. And the first to deliver the highest level of realism possible. Now you're unstoppable.

ATI.COM

Copyright 2002. ATI Technologies Inc. All rights reserved. ATI and RADEON are trademarks and/or registered trademarks of ATI Technologies Inc. All other company and/or product names are trademarks and/or trademarks of their respective owners.

This One

SU84-XWZ-K7H5

Copyrighted material

take precautions accordingly.

***Maximum PC* is explicitly and unabashedly *not* intended for IT managers or people working at companies. We are 100 percent geared toward hardcore system hackers, a subculture of people who freely admit they spend as much time *working* on their PCs as *using* their PCs. Our readers actually get pleasure from reformatting their computers. Yes, it's true. They just want to know the most effective ways to do it.**

Our article went to great lengths to show people just how important it is to have drivers in hand before reformatting. And for what it's worth, both of our Clean Start articles (Win98 and WinXP) have been very well-received by readers. Some people have asked technical questions when stumped, but no one has ever blamed us for anything bad that happened to his or her system. Finally, with our Clean Start drive-imaging method, there's no need to tweak "reinstalled" programs—precisely because all programs were pre-tweaked to the user's liking before the drive-imaging process occurred. That's the whole point of the article.

SPEAKING UP ABOUT SILENT PCs

In the July issue, you discussed reducing case noise by using foam, applying filters, and turning off unneeded fans. While cutting down on case noise, though, you increase operating temperature—maybe not by a significant measure, but still the temps went up. Why not consider noise cancellation or noise masking? A pink noise generator, small 3-watt amp, and small speaker located in the case could reduce case noise by 10db, which is what I guessed you achieved with your methods, since you provided no actual measurement of noise reduction. Noise cancellation has been used in large offices for years to quiet all the racket that computers make.

—JEFF ADAMS

TECHNICAL EDITOR WILL SMITH RESPONDS: Let me share a little story with you, Jeff. Last Tuesday, I was sitting at my desk, and a fly landed smack dab in the middle of my keyboard's H key. While I was looking around for something to swat the fly with, I happened upon two likely items—a copy of *MacAddict* and my trusty *Maximum PC*-branded baseball bat. Either one would smoosh the fly, but I decided that the baseball bat was probably overkill.

Using a pink noise generator to quiet a single PC is just like swatting a fly with a baseball bat. It's overkill. The solution you're suggesting would cost around $30, and would only mask the noise, not eliminate it. Besides, we've only really been impressed with noise-cancellation technology in "closed-ear tests" (i.e., headphone applications), not in open-room tests. In our experience, noise-cancellation only begins to prove effective when you're sitting in a room with 20 or 30 noisy PCs.

Our method did increase the case temperature, but by only about 20°F, which is entirely acceptable for non-overclockers. If you overclock your system, be sure to test your case temps every step of the way.

DUST AWAY YOUR TROUBLES

In your July 2002 issue, you used fan filters to quiet your PC. Another benefit of fan filters is to keep dust out of your box. You said air conditioner-type foam filter would work fine. What would work even better is a thin electrostatic filter. At Home Depot, I found very thin (less than 1mm) electrostatic filtering that's as easy to cut as foam. A 12-pack, approximately 25cm by 10cm, is just $5. The filters work great. Anyone with a dust problem should buy these.

—MICHAEL MAKOVI

TECHNICAL EDITOR WILL SMITH RESPONDS: That's exactly the sort of thing we'd hope to find at Home Depot! A sliced-up air conditioner filter is perfect for filtering the incoming air and killing sound.

COMING NEXT MONTH

IN THE AWESOME NOVEMBER ISSUE OF MAXIMUM PC

THE ATHLON IS BACK!

AMD ANSWERS THE INTEL CHALLENGE

The Athlon may have been the power-user's darling in 2001, but this year the CPU just hasn't kept pace with sheer P4 horsepower. But wait! The Athlon is back, and faster than ever. We test AMD's latest processor advancements and give you the definitive answer to the suddenly relevant question, "Which CPU should I buy, P4 or Athlon XP?"

NOTEBOOK UPGRADING:

A STUDY IN CONTROLLED MADNESS

They said it couldn't be done. They said it shouldn't be done. So, naturally, we had to do it. We've got three case studies—complete with specs and instructions—that prove you can wring much more life from an aging notebook computer.

COMPLETE GUIDE

TO MOTHERBOARD ENGINEERING

Maximum PC uncovers the mystery of motherboards—how they're spec'd, how they're engineered, how they roll off the assembly line. Want to know the difference between MicroATX and FlexATX? Wondering why an eight-layer board is such a mother to produce? Want more info on all the qualities that make a mobo a feat of electrical engineering? Hah! You must read our report to find out.

Copyrighted material

KEEP ON KICKIN' ON!

I work in a school. The students always ask me what magazine I'm reading, and as much as I'd love to tout how great *Maximum PC* is, I find myself apprehensive about showing it to them because of the bold graphic "Kick Ass" on your favorite reviews. Couldn't you accomplish the same thing with "Kickin!" or something? I know that most of the students use the word "ass" as soon as they leave my office—I just can't be the one who hands it to them or promotes it. Keep on "Kickin!"

—SHANE NELSON

EDITOR-IN-CHIEF JON PHILLIPS RESPONDS: We sympathize with your predicament, but we really can't change a catch phrase that's so overwhelmingly embraced by the readership. I should point out that 99.99 percent of all the language one might find in the magazine is aired regularly on prime time TV—including the phrase "kick ass." That said, thanks for your personal support of the mag!

...99.99 percent of all the language one might find in the magazine is aired regularly on prime time TV—including the phrase "kick ass."

POWER STRUGGLE

I have a friend whose Dell 833MHz became real twitchy after installing an extra hard drive, a Radeon 8500DV videocard, and a CD burner. I advised him that his itty-bitty, 200-watt power supply was overloaded. He obtained an Antec 400-watt supply and brought it over to my house to install. Upon opening his Dell, the wiring didn't look kosher. Luckily my hindsight, foresight, and insight overrode my Alzheimer's. Antec had included a pin-out chart of power connectors with the new supply. Using a multimeter to measure the Dell power-supply pin-outs showed no matches whatsoever. I can only imagine the resulting fireworks had we mated the Antec power supply with the Dell motherboard.

Please advise your readers that in no way should they mate a new *standard* power supply with a Dell motherboard, or a new *standard* motherboard with a Dell power supply in an attempt to upgrade their machines. Both parts need to be swapped upon upgrade. A search of Dell's web site revealed that larger power supplies are not available. I have to wonder why Dell sells cases with all those extra drive bays, but offers such dinky power supplies. I've been advising people to purchase Dell computers, but after this discovery, I will stop until Dell begins using standard power supplies and motherboards. Why would a computer builder use nonstandard wiring on a standard ATX connector? It's just setting up customers for a disaster on future upgrades.

—ALAN D. SMITH

SENIOR EDITOR GORDON MAH UNG REPLIES: Good advice, Alan. We covered the quirky Dell power supply sometime ago, but it bears repeating.

Dell doesn't wire its power supplies using the ATX standard, but it does, unfortunately, use the same ATX power connector, and that tends to confuse people. When we confronted Dell about this a few years ago, company officials backed up their design decision, saying it's superior to the ATX standard. Dell says it first added additional power through the AUX connector because its engineers found that motherboards needed more than what the main plug could supply. Either way, you pretty much have to ditch the motherboard and power supply from the older Dells if you want to upgrade the system. If you're still interested in upgrading the power supply, you can get one from PC Power and Cooling (www.pcpowerandcooling.com). The company actually sells power supplies that have been wired in a fashion similar to Dell's. ■

LETTERS POLICY: ***MAXIMUM PC*** invites your thoughts and comments. Send them to **input@maximumpc.com**. Please include your full name, town, and telephone number, and limit your letter to 300 words. Letters may be edited for space and clarity. Due to the vast amount of e-mail we receive, we cannot personally respond to each letter.

Conventional Wisdom

Best & Worst of Maximum PC

To put our 50th issue in perspective, we published an online call for commentary: What have been the best and worst moments in *Maximum PC* history? The most insightful replies appear below.

I love it when I read a review, and it totally disses the product, then I flip the page and find a full-page ad for the same part!

— JOHN KINGSTON

The original Geek Test (May 2001). What an engaging feature, and what an eerily accurate way to gauge enthusiasts vs. mere users!

— MIKE CRAFT

One of the highest points in your history was when you guys "found" an old TNT videocard frozen in the back of your freezer. After defrosting it, *Maximum PC* boldly went where no smart technician would ever go—you plugged it into an old test system. Upon booting up, you found that the system and videocard worked perfectly, thus proving "that it's OK to freeze your hardware."

—BEN PEARMAN

The article about completely revamping your Win98 install ("Clean Start," June 2000) was the best darn piece of computer how-to writing I've seen. That piece was a watershed in taking my computing hobby to another level.

—JIM STUARD

Dream Machines 2001. The idea: unparalleled. The performance (at the time): unmatched. The joy in remembering it: unforgettable.

—DAVID COX

The worst moment had to be your review of batteries. A whole frigging article devoted to batteries? What's next? Side-by-side comparisons of rubber bands?

—LARRY SOLOMONSON

"Hardware Assassin," Dec. 2000. This article was a sick joke. Just pictures of wanton destruction of computer components. I couldn't believe anyone would print this crap.

— GREG VAN DER WEGE

First, I have to say that *Maximum PC* is the greatest magazine to ever hit the stands. But the worst articles you ever put out were on MP3s. They part from your hardcore PC ways. Everybody knows about MP3s, and pretty much everybody knows how to get them.

—CHRIS BENCE

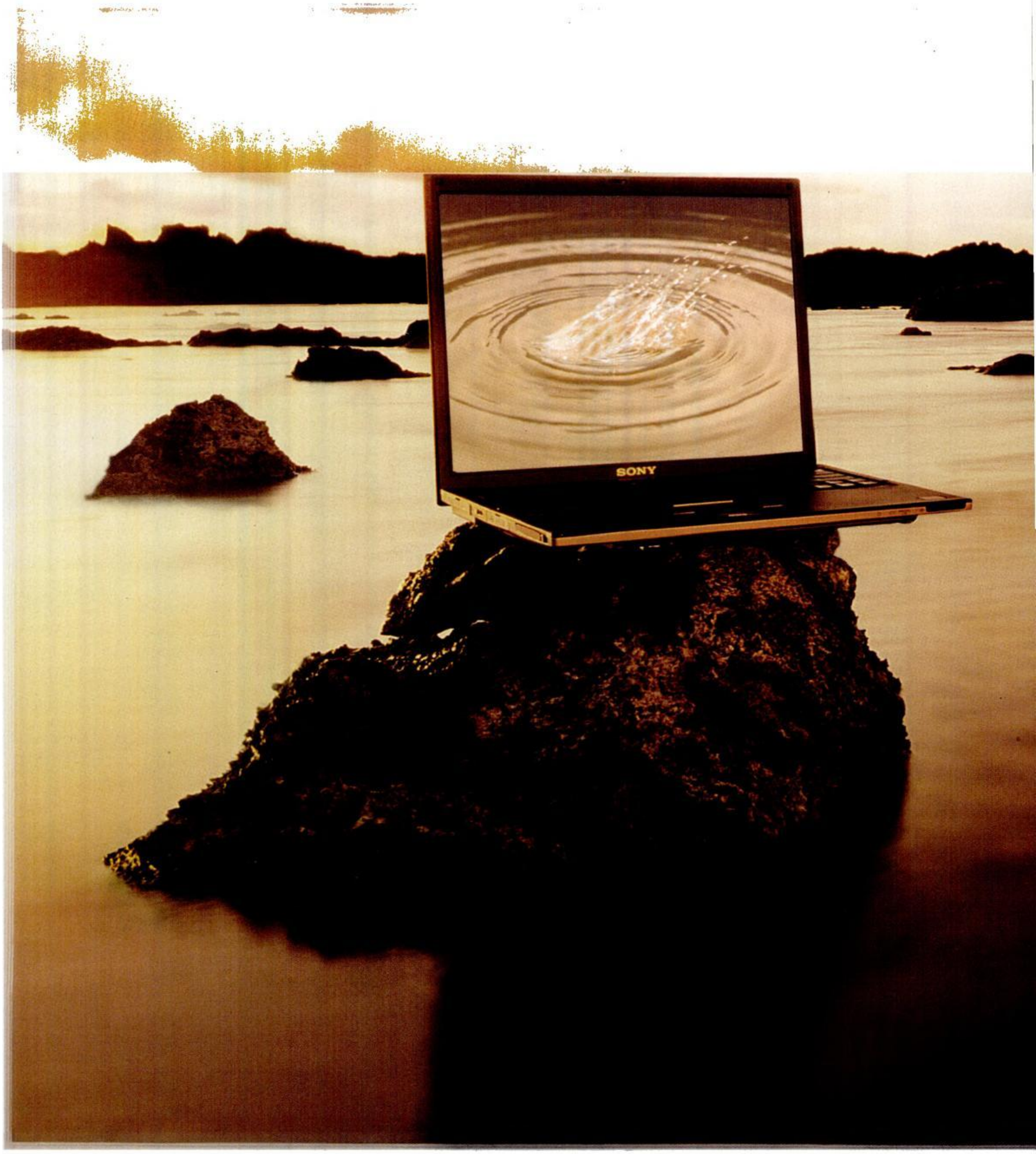
Your taste in monitors. What are you guys, giant mutants? For the price of your 19-inch monitors, I can get a whole system from CompUSA.

—IZAAK MIRRO

One of your lowest points was having Dick Matthews writing Windows Tips for Morons. His condescending attitude and lack of real Windows knowledge dragged the magazine to new lows.

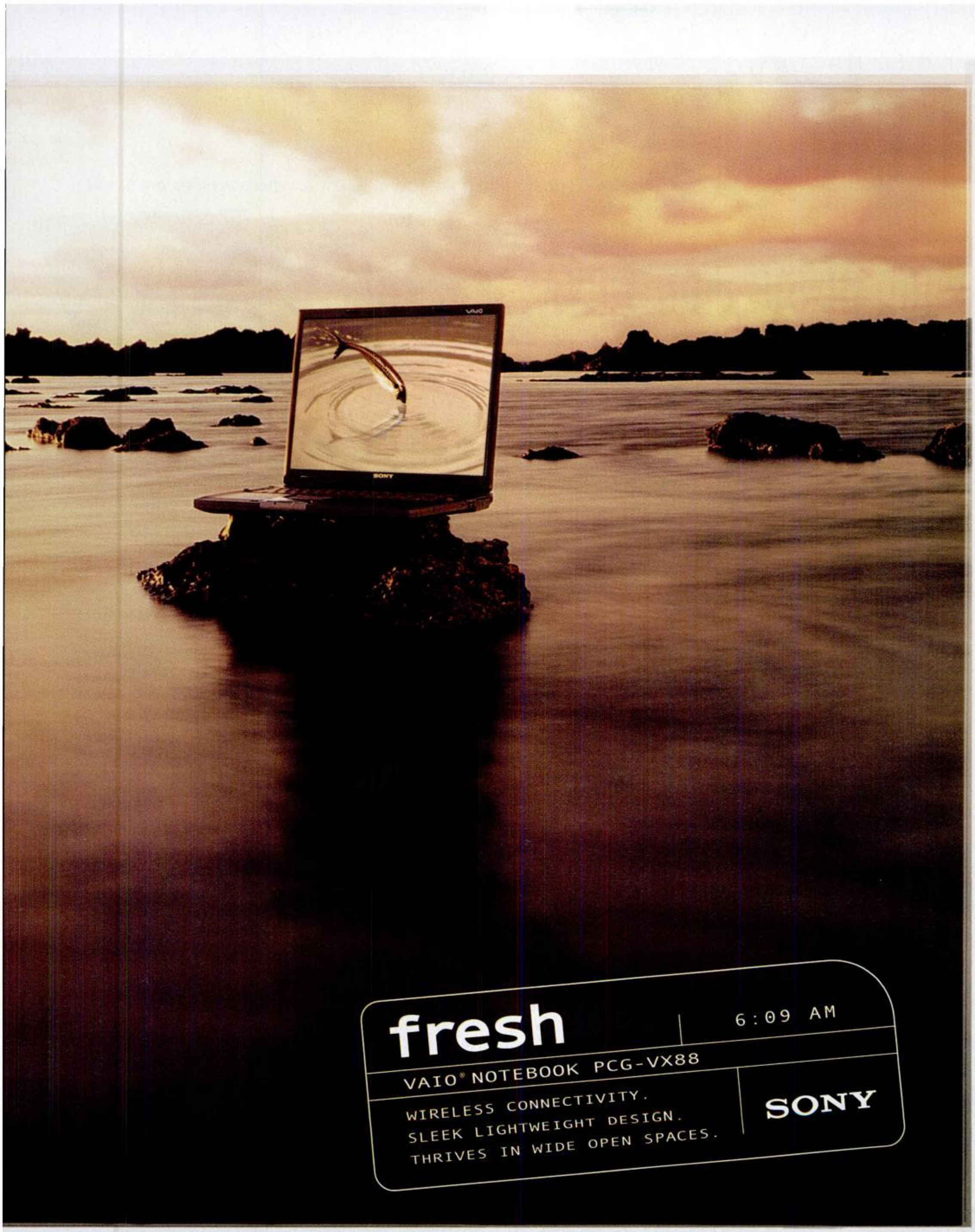
—KRIS COURTER

Copyrighted material



Wires are restraints, nothing more. They keep you away from fresh air and fresh thinking. But any chains can be broken with the right tools. Like a Sony VAIO notebook PCG-VX88, powered by the Mobile Intel® Pentium® III Processor - M. Featuring wireless networking when you're home.[1] Wireless Internet when you're away.[2] Even the

Copyrighted material



©2002 Sony Electronics Inc. Reproduction in whole or in part without written permission is prohibited. All rights reserved. Sony, Memory Stick and VAIO are registered trademarks of Sony. Intel, the Intel Inside logo and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Wireless LAN access point sold separately for GRX model. Wireless connectivity requires 802.11b hot spot, some of which require fee. Microsoft and Windows are trademarks of Microsoft Corporation. All other trademarks are trademarks of their respective owners. Certain software product(s) included with this computer may include features such as copy protection and content management technology. USE OF THE SOFTWARE PRODUCT(S) REQUIRES AGREEMENT TO APPLICABLE END USER AGREEMENTS AND FULL COMPLIANCE WITH APPLICABLE PRODUCT ACTIVATION PROCEDURES. Product activation procedures and privacy policies will be detailed during initial launch of the software product(s), or upon certain reinstallations of the software product(s) or reconfigurations of the computer, and may be completed by Internet or telephone (toll charges may apply). Preinstalled versions of software may not be identical to retail versions. Not recommended for use on sand or in water. Screen image simulated.

connectivity of a Memory Stick® media drive. All packed into an ultra-slim notebook that's everything a laptop is supposed to be. Empowering. Liberating. Fresh. **www.sony.com**

Sony recommends Microsoft® Windows® XP Professional for Mobile Computing.

Copyrighted material

Quick Start

The beginning of the magazine, where articles are small

Invasion of the Poor-Boy Videocards

The budget 3D graphics scene is exploding—but who has the stomach to install these underpowered suckers?

Trident (yup, *that* Trident) wants a bigger piece of the 3D graphics pie. So it's introducing the XP4 T3 chipset.

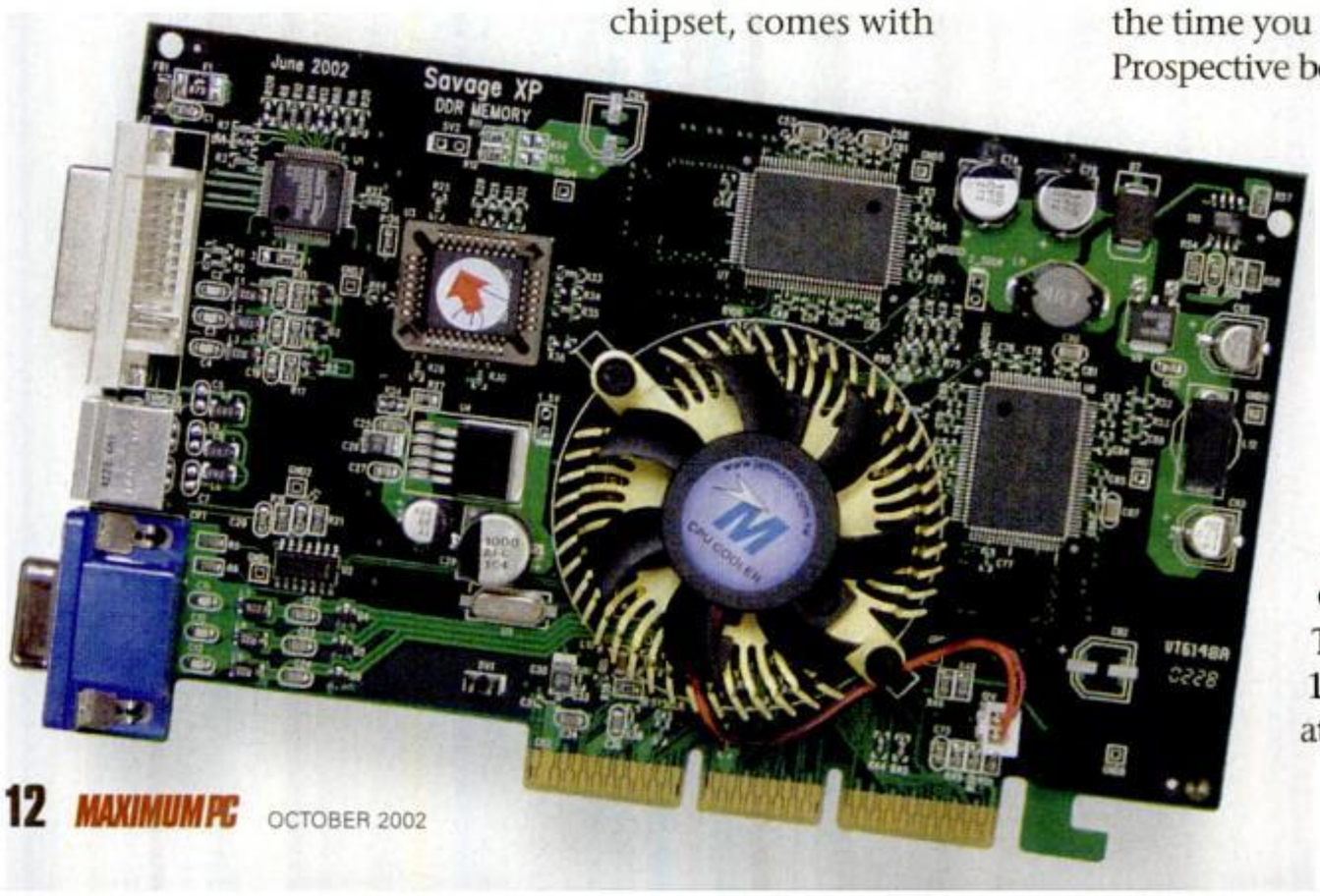
With nVidia owning Boardwalk and ATI owning Park Place, it would seem as if Tweedledee and Tweedledum have a stranglehold on the entire videocard Monopoly board. But now a bunch of new competitors have entered the game, and they seem quite content to own low-rent property.

Tyan, Crucial, and VIA, oh my! What are these guys doing making graphics boards? When you look at the specs of these up and comers, they don't seem fit to hold their own against the big boys. The truth is, these small fries can't—but then again, they're not really trying to.

The "New Young Bucks of Budget 3D" (that's our catch phrase; feel free to use it) simply believe there's some money to be made by bringing up the rear. Take the new Trident XP4 T3 chipset. A Trident rep told us that it will perform 80 percent as well as the GeForce4 Ti 4600, while selling for just one-third the cost.

Here's a look at the new minor-league players and what they'll be shooting down the pipe.

S3 is giving nVidia a run for its money by releasing a budget videocard that boasts vertex and pixel shaders—features that the GeForce4 MX lacks.



➤ **Tyan:** The vaunted mobo manufacturer has already launched the Tachyon G9000 Pro. It's based on ATIs Radeon 9000 Pro chipset, comes with DVI and S-video out, and costs just $135. This first offering features 64MB of 275MHz DDR memory, and 11GB/sec of memory bandwidth. Advanced 3D features include vertex and pixel shaders, and 16x anisotropic filtering. (Hah! We dare you to run it!). The new Tyan product may be an ATI-based budget card, but it outperforms GeForce4 MX cards by a significant margin.

➤ **Crucial:** They might be "the memory experts," but the folks at Crucial are also developing a taste for ATI-style 3D. The company's first videocard is based on the 128MB Radeon 8500LE, a slower-clocked version of the Radeon 8500, which was ATI's first chip architecture to support programmable shaders. The Crucial card will be priced at $140.

➤ **S3:** Just like Trident, S3 has awakened from hibernation and is preparing to launch a budget card loaded with next-gen features. The product is called SavageXP, and S3 (now under the ownership of VIA Technologies) says that it should be available in the U.S. by the time you read this. Prospective board manufacturers include Tyan and PowerColor. The $80 card will nearly match the GeForce4 MX 440 in terms of memory and clock speed, but will come with vertex shaders and pixel shaders, which the GeForce4 MX lacks. The card's 64MB of 128-bit DDR will run at 183MHz, and supposedly provide 5.8GB/sec of memory bandwidth.

➤ **SiS:** This company is mostly known for developing motherboard northbridge chips, and traditionally unstable ones at that. Its videocard aspirations, however, are downright wacky. The SiS Xabre 400 sports 128MB of DDR memory (running at 250MHz) and comes with support for programmable pixel shaders. The price is $150, making the Xabre rather expensive for a budget card that claims to offer GeForce4 MX–level performance in basic games. Memory bandwidth is spec'd to peg at 8.2GB/sec, but with only software emulation support for vertex shaders, we have to wonder why anyone would buy such an expensive card.

➤ **Trident:** That's right: Trident's back in the game. Didn't this company used to make those no-name "3D PCI VGA Videocards" you could buy at your local computer shop for $20? Indeed it did. But now Trident is trying to make a name for itself with its new XP4 T3 chipset. For starters, the 128MB of onboard DDR will be clocked at 350MHz, and the card's memory interface is good for 11.2GB/sec of total bandwidth. And while the chip will employ an unorthodox tile-based rendering scheme (the same strategy that's been used by the Kyro family of cards, to dubious effect), the Trident XP4 T3 does include hardware vertex and pixel shaders. Not bad for a card that could clock in around $100.

Copyrighted material

Habeas Uses Haiku to Fight Spam

A Palo Alto, CA–based company called Habeas, Inc. is promoting a new method of spam abatement—and its key weapon is poetry. The strategy essentially uses copyright law to ensnare the spammers of the world in a legal hellhole.

Here's how it works:

1) By signing up at **www.habeas.com**, ISPs get a free license to place the following lines into the header portion of every e-mail they send:

Emily Dickinson: Spam fighter?

- X-Habeas-SWE-1: winter into spring
- X-Habeas-SWE-2: brightly anticipated
- X-Habeas-SWE-3: like Habeas SWE (tm)
- X-Habeas-SWE-4: Copyright 2002 Habeas (tm)
- X-Habeas-SWE-5: Sender Warranted Email (SWE) (tm). The sender of this
- X-Habeas-SWE-6: email in exchange for a license for this Habeas
- X-Habeas-SWE-7: warrant mark warrants that this is a Habeas Compliant
- X-Habeas-SWE-8: Message (HCM) and not spam. Please report use of this
- X-Habeas-SWE-9: mark in spam to <http://www.habeas.com/report>.

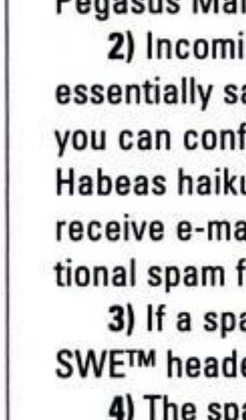
If your ISP hasn't signed up yet (or you're not running your own e-mail server), it's possible to manually place the lines into the header of your e-mails, but you'll need an e-mail client that permits you to do so, such as Pegasus Mail (**www.pmail.com**).

2) Incoming and outgoing e-mails that contain these headers are essentially saying "I'm not spam." So once you or your ISP has signed up, you can configure your e-mail client to place incoming e-mails with the Habeas haiku at the top of your inbox. You'll still be able to send and receive e-mail with non-Habeas headers, and you can still use your traditional spam filters as well.

3) If a spammer sends out unsolicited commercial e-mails with the SWE™ header, it violates the Habeas license.

4) The spammer then gets prosecuted with the legal equivalent of a double-barreled shotgun: Not only has it reproduced the copyright-protected haiku without permission, but the poem's third line also integrates a corporate trademark, which also cannot be legally reproduced without permission.

Although individuals and ISPs can get a Habeas license free of charge, businesses must pay a fee of $200 per year. Bulk mail firms may still use the Habeas headers, but they must certify that their mailings are exclusively opt-in. Of course, the more people and ISPs that use the haiku, the better the system will work. A panacea? Maybe, maybe not. But show us something aimed at spam, and we'll be the first to pull the trigger.



Jargon-buster!

Haptics: Using the sense of touch to interact with machines and computers. It comes from the Greek *haptikos*, meaning *to touch*.

The New Fab Four

To baby boomers, the "Fab Four" will always mean the Beatles. But there's a new Fab Four: a quartet of cutting-edge chip-fabrication technologies that is boosting the performance and driving down the cost of the latest microprocessors.

Those technologies are copper interconnects, silicon-on-insulator (SOI) transistors, deep submicron processes of 100 nanometers or less, and 300mm silicon wafers. Like the original Fab Four, they will be an overnight success that was years in the making. Often it takes a decade for innovative semiconductor technologies to reach mass production. It takes that long to build the billion-dollar fabs, squash the bugs, and start punching out reliable chips.

IBM pioneered copper and SOI in PowerPC processors in 1998, but they are fairly recent arrivals to the x86 processors in most PCs. Copper replaces aluminum in the chip's interconnects, which are layers of metal wires connecting the tiny transistors etched into the silicon. Copper is a superior conductor, so the chip runs faster while burning less power.

AMD partnered with Motorola to introduce copper in 2000 with the 0.18-micron Athlon. That allowed Athlon to break the 1GHz barrier with ease. Intel pushed the aluminum Pentium III hard to keep up, but didn't begin using copper until the 0.13-micron generation, led by the 1.13GHz Tualatin mobile Pentium III last year. All new Pentium 4 chips use copper.

Likewise, AMD will probably be the first to use SOI in an x86 chip when the 64-bit Hammer processors debut in the next few months. SOI reduces the capacitance of transistors, which allows them to switch their on/off states more quickly, which pumps up the chip's clock speed. Although SOI is a proven technology in the PowerPC, Intel remains skeptical and probably won't adopt it for two more fab-process generations. Instead, Intel will rely on the Pentium 4's deep pipeline to reach higher clock frequencies.

The next process generation will be 0.09 microns, also known as 90 nanometers (nm). It's coming in the second half of 2003. The first x86 chips likely to use this smaller, faster, more economical process will be Intel's Prescott Pentium 4, an AMD Thoroughbred-series Athlon, and a Hammer derivative. Eventually it will push clock speeds beyond 4GHz.

Intel and AMD are also moving to 300mm (12-inch) silicon wafers, which drive down costs by yielding twice as many chips as today's 200mm (8-inch) wafers. Intel has a big lead—it began shipping 2.4GHz Pentium 4 chips from its new 300mm fab in Oregon last April. AMD won't catch up until 2005, when a joint venture with Taiwan-based UMC opens a 300mm fab in Singapore.

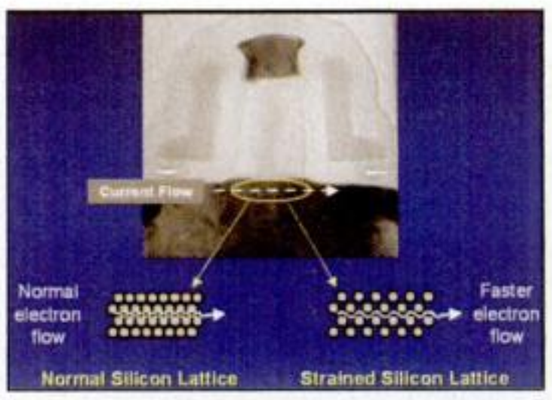
Tom Halfhill was formerly a senior editor for Byte *magazine and an analyst for* Microprocessor Report. *He is now a technical writer/analyst in Silicon Valley.*

Copyrighted Material

Intel Announces New Chip Fab Technique

90 nanometers, here we come!

Future Pentium 4 processors will run faster with help from a new chip fabrication technology that Intel will introduce next year. Known as strained silicon, the technique will boost the clock frequency of the next Pentium 4 (codenamed Prescott) by allowing electrons to move more quickly through the chip's silicon.



The "strained" silicon layer promotes faster electron flow, and thus, faster processors.

Silicon has relatively tight atomic spacing that impedes the flow of electrons—the negatively-charged subatomic particles in electricity. To relieve that congestion, the strained-silicon technique adds a thin layer of silicon germanium (SiGe) beneath the silicon layer. SiGe atoms are spaced more widely apart than silicon atoms. The tightly bonded SiGe layer exerts stress at the atomic level that stretches, or "strains," the silicon layer, pulling the silicon atoms further apart. That increases the mobility of the electrons, speeds up the chip's transistors, and boosts the clock frequency.

Intel isn't saying how much faster Prescott will run with the help of strained silicon. Other companies experimenting with similar technology are claiming increases greater than 100 percent. Intel's first-generation strained silicon will probably accelerate clock speeds by less than one-fourth that amount—which is still significant, because it inflates manufacturing costs by just 2 percent. Intel will introduce strained silicon with its 90-nanometer fabrication process in the second half of 2003. (That's right: After the 0.13 process is retired, we'll no longer be referring to process technologies in terms of microns!).

See the Fast Forward column for more about fab technology.

Recordable DVD, Round Two

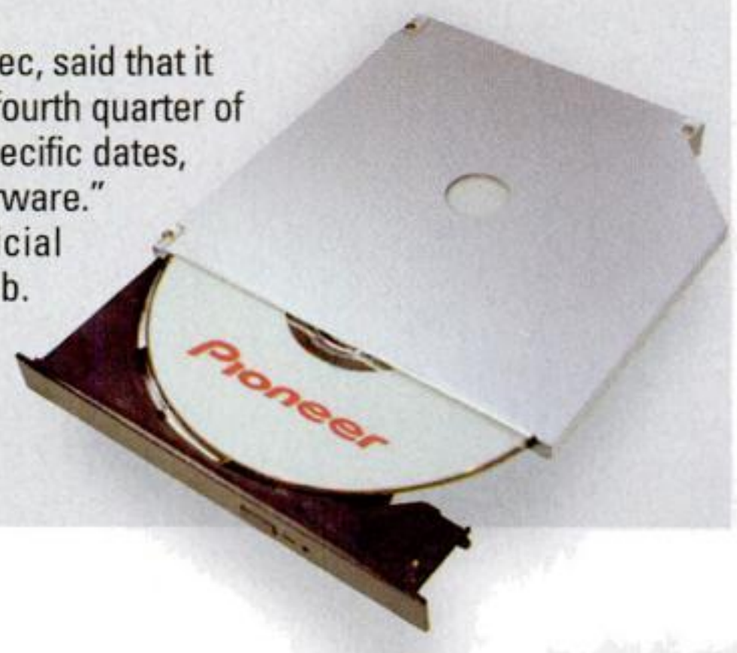
Competing consortiums threaten to increase speeds

Both camps in the recordable DVD standards war, DVD-RW and DVD+RW, are gearing up to double the burning speeds for write-once media.The DVD+RW Alliance was the first to announce specs when it declared that DVD+R recording will soon hit 4x. This speed is roughly equivalent to 36x CD-R recording, and should allow a full 4.7GB disc to be written in around 15 minutes.

But we wouldn't blame you if you took this announcement with a grain of salt. DVD+RW didn't fall into the hands of consumers until literally years after the initial flurry of press releases. None of the three DVD+RW manufacturers we contacted were able to confirm release dates for 4x DVD+R drives, and one of them even suggested skepticism that DVD+R media would be available by the holiday season.

Pioneer, the creators of the DVD-R/W spec, said that it expects to release 4x DVD-R writers by the fourth quarter of 2002. Pioneer was hesitant to give us any specific dates, however, saying "we never announce vaporware."

We'll consider either format to be official when an actual product arrives in the Lab. We did, however, manage to catch a glimpse of Pioneer's upcoming notebook DVD writer(pictured here). How fast is it? When we know, so will you.



FUN-SIZE NEWS

Bush Advisor Gives Thumbs Up to Hackers

Richard Clarke, appointed Director of the Office of Cyber Security by President Bush, wowed the audience at a Black Hat conference on computer security by announcing that most security holes in software are not found by the software maker. Clarke told audience that "some of us, here in this room, have an obligation to find the vulnerabilities."

Imagine: an implicit endorsement of hackers' attempts to find security vulnerabilities, actions that are often met with harsh retaliation from embarrassed corporations! HP, for example, initially threatened security analysts who demonstrated a bug in the company's Tru64 OS with a lawsuit invoking the Digital Millennium Copyright Act (a threat they later backed down from). Clarke stated that "if there are legal protections [hackers] don't have that they need, we need to look at that."

MRAM May Give Boot Times the Boot

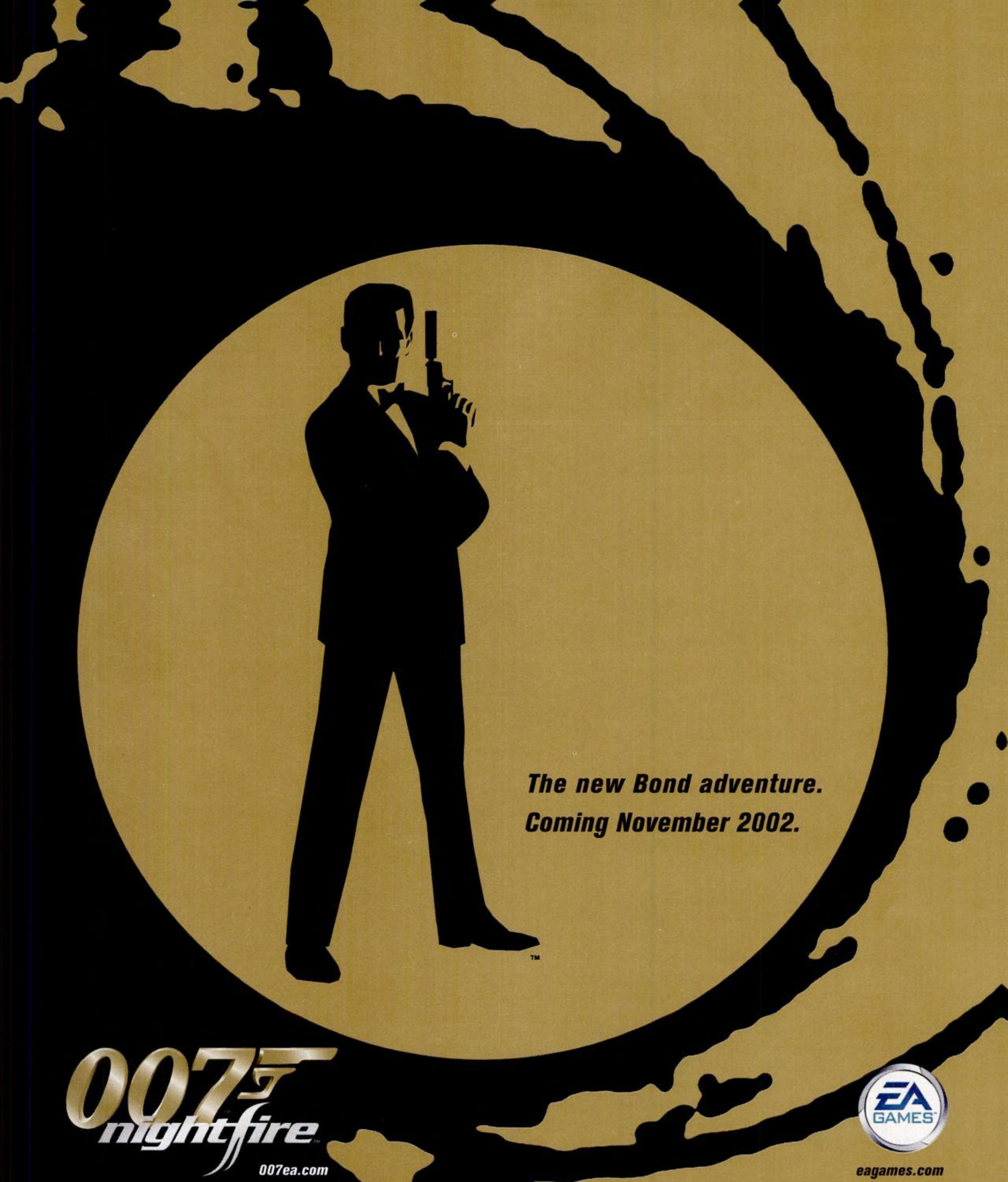
Firing up Windows XP in less than 30 seconds is good. But a PC that boots up in no time is better. That's the promise of MRAM, a technology being developed by Sandia National Laboratories and Pacific Northwest National Laboratory.

The two R&D houses have developed a process that dramatically reduces the thickness of the layers present in conventional microelectronics. The new method uses a chemical reaction to spread atoms evenly above a metallic surface that can bind easily to the layers above them. The short story is that not only will such memory be much faster than today's RAM, but it will also require so little voltage, it could be made nonvolatile (in other words, it won't lose its data when your PC is powered off).

DMCA Sponsors Say They're Sorry

Speaking of the Digital Millennium Copyright Act, many of the sponsors are openly expressing regret for initially supporting the bill. Rep. Zoe Lofgren (who voted for the bill) remarked at a panel sponsored by the Cato Institute, "I think we have had a very wide set of anti-technology rules emerging from the courts." The Consumer Electronics Association, which also initially endorsed the bill, did a bit of hand-wringing too. Of the DMCA, CEA President Gary Shapiro said, "We signed off on it, and it was a huge mistake." No comments or sweeping plans were discussed to reign in the bill, however. Maybe they'll take on that one at the next meeting.

Copyrighted material



The new Bond adventure.
Coming November 2002.

007 nightfire™

007ea.com

eagames.com

RATING PENDING
RP
CONTENT RATED BY ESRB
Visit www.esrb.org or call 1-800-771-3772 for Rating Information.

Metro Goldwyn Mayer
MGM INTERACTIVE

NIGHTFIRE Interactive Game (all object code, all other software components and certain audio visual components only) ©2002 Electronic Arts Inc. Electronic Arts, EA GAMES and the EA GAMES logo are trademarks or registered trademarks of Electronic Arts Inc. in the U.S. and/or other countries. All rights reserved. NIGHTFIRE Interactive Game (certain audiovisual components) ©2002 Danjaq, LLC, and United Artists Corporation. JAMES BOND, 007, James Bond Gun and Iris Logos and all other James Bond related trademarks TM Danjaq, LLC. James Bond, 007, James Bond Gun and Iris Logos and all other James Bond related properties ©1962-2002 Danjaq, LLC, and United Artists Corporation. NIGHTFIRE is a trademark of Danjaq, LLC, and United Artists Corporation. All other trademarks are the property of their respective owners. EA GAMES™ is an Electronic Arts™ brand.

Copyrighted material

Are PC Games a Dying Breed?

The rise of the new generation of consoles (Xbox, Cube, PS2) and the corresponding fall in computer game sales was the least surprising trend of the past year. We knew it was coming, but now that it's here, the change in the landscape is breathtaking. It proves something PC gamers are loathe to admit: Like Internet stocks, PC gaming in the 1990s was an aberration, a bubble. Driven first by the CD-ROM and then by 3D accelerators, PC gaming took the lead in cutting-edge content. Full-motion video, 3D environments, sophisticated gameplay, online gaming: These things made PC games unique. They helped computer games move from the realm of the hobbyist into the mainstream.

And while computer games will never return to a mere hobby market, their heyday is, for the foreseeable future, at an end. Like some kind of silicon brachiosaurus, computer gaming is being brought down by its own weight. It's simple economics: A single piece of a computer gaming rig—the accelerator card—costs more than an Xbox, and doesn't look nearly as cool, come with a DVD player as a basic feature, or display on a huge TV.

In the past, that wouldn't have mattered as much. Content is king and PCs had a monopoly on the best games of the 1990s. And now? The A-list titles exclusive to PC this year were *Warcraft III*, *Neverwinter Nights*, *Age of Mythology*, and *DungeonSiege*. And folks, that's it. If some other big-budget title with mass appeal was published since January, I missed it. Other strong PC titles for the year—such as *Morrowind* and *Jedi Outcast*—are already on their way to the Xbox, with new console versions of *Tribes* and *Unreal* due shortly. The A-list of unique, must-have PC titles hasn't been this sparse in a decade.

More ominous is the virtual obliteration of the B list: games that have a solid audience but never achieve blockbuster status, like *Flashpoint* and *Age of Wonders II*. Five years ago you could've found a couple hundred B-list titles like these in a given year. Find me a couple *dozen* today. Ironically, the smallest of all niches—wargames—is thriving, thanks to their modest development costs and dedicated fan base.

Mainstream computer gaming is one controller and an Internet connection away from being thrust into irrelevance. Once someone finds a way to effectively and comfortably replicate the fine controls of a first-person shooter for consoles, and once the major console makers get their online gaming services up and functioning, PC gaming will find itself loping toward the tar pits.

Not even *The Sims* can save it.

They, too, are heading for the consoles.

Tom McDonald has been covering games for countless magazines and newspapers for 11 years. He lives in the New Jersey Pine Barrens.

A Film Brought to You by Quake III

These days, everyone in Hollywood has a videogame adaptation in the works. But some people are making movies *from* videogames—literally. Using existing 3D game engines and modding tools, a new type of animation is finally getting proper recognition. It's called Machinima, and its auteurs presented their very first film festival this August in Mesquite, Texas (home of id Software).

Unlike traditional CG animation that has to be rendered frame by frame, Machinima uses existing 3D game engine technology (see page 42) to create virtual worlds complete with polygonal characters and sets. The first-person perspective used by these game engines then becomes the "camera," recording the action. Post-production is just a matter of editing and adding dialogue. The finished product can be viewed as a scripted game mod, or recorded in realtime and exported to common video formats such as QuickTime, Windows Media, and DivX.

For now, Machinima casts a wide umbrella: The content ranges from action-oriented videogame fare, all the way to full-fledged comedic short films that bear little resemblance to the blood 'n' guts game engines from which the Machinima was spawned. Check out the films at **www.machinima.com**. Budding machinimartists can go to **www.machinima.org** for information on the Academy of Machinima Arts and Sciences.

***Quake II* meets *South Park* in a scene from *Hardly Workin'*, a short comedy by the ILL Clan (www.illclan.com).**

Give Those Games a Hand

You've got to hand it to them—Essential Reality is taking a bold new step forward in game controllers. The P5 is a glove-like controller that slips over your hand and allows you to aim, fire, frag, and tag using simple gestures and finger-twitches. Instead of using expensive—and heavy—internal gyroscopes to detect motion as navigational systems do, the P5 technology uses optical sensors embedded in a docking station to track motion along six axes (X/Y/Z, as well as yaw, pitch, and roll).

We've tried pre-production versions at both the CES and E3 trade shows, and though it takes some getting used to, the P5 shouldn't be too difficult for anyone who's learned to flip the birdie or bust out with the Vulcan greeting. The versions we tested did lose tracking when we waved out of range, but could be easily reset by pointing offscreen.

In Lionhead Studio's groundbreaking God game *Black & White*, the game was almost entirely controlled by a single, disembodied hand that could create miracles, feed the hungry, or on a bad day, throw peasants into the sea. So it seems fitting that Lionhead was one of the first companies to officially announce its intention to integrate Essential Reality's P5 controller into both *Black & White* and the add-on pack *Black & White: Creature Isle*. Essential Reality intends to have the P5 on shelves by the holidays, at a suggested price of $150. Get a peek at **www.essentialreality.com**.

Copyrighted material

Unapologetically advanced.

Hitachi introduces the world's first multi-format DVD camcorder. It's so advanced, it literally changes the way home movies are made. The UltraVision Digital DVD Camcorder records onto DVD-R or DVD-RAM, plays back on most computer DVD drives and most standard DVD players, and shoots digital still photos, too. Edit on your computer and make copies of discs for friends with optional editing software. Or edit in the camcorder with the easy disc navigation system. It's a whole new way to make home movies. And view them. See for yourself at your nearest Hitachi dealer.

UltraVision. The one to watch.

www.hitachi.com/tv

ULTRAVISION DIGITAL

© 2002 Hitachi, Ltd. UltraVision Digital is a registered trademark of Hitachi Home Electronics (America), Inc.

HITACHI
Inspire the Next

Copyrighted material

Head2Head

A showdown among natural competitors

THIS MONTH: Digital Spy Cameras

Thanks to the shrinking size and cost of CMOS sensors, you can now find 1.3-megapixel digital cameras that are smaller than a cassette tape and affordable as hell. Granted, a maximum resolution of 1.3 megapixels isn't going to win you any photo contests, but that's not the point. The Logitech Pocket Digital and BenQ DC1300—two of the tiniest cameras we've seen that don't totally suck—strive to be ultra-portable and accessible to amateurs. Let's see if they meet our power-user requirements...

—KATHERINE STEVENSON

BENQ DC1300

Basic technology: Both cameras rely on a CMOS sensor and USB 1.1 interface, but the two couldn't be more different when it comes to batteries. The DC1300 is powered by a pair of AAAs. You know the story: They're cheap and easy to find, but they can run out of juice quickly, so you'll always want to have a supply of backups handy. **Winner: Pocket Digital**

Portability: Though both cameras are undeniably small and lightweight, the DC1300 requires a carrying case in order to protect its exposed lens. Bundled with the camera are two cases: One is a 6-inch round, ugly plastic contraption that's more difficult to open than a Tylenol bottle. The other is a soft, spongy pouch with a Velcro closure that respects the DC1300's small profile, and is way more acceptable for whipping out in public. Whatever. The Pocket Digital is slimmer and lighter, and offers built-in lens protection. **Winner: Pocket Digital**

Coolness factor: It might look like a badass spy camera, but two factors make the DC1300 ill-suited for undercover work. First, there's no way to hide the lens, so your marks will always know they're about to be photographed. Second, because it requires a case, it'll never be "at the ready" for spontaneous shooting. Now, compare this with Logitech's offering: With the Pocket Digital, you can slide open the thin, metallic sheath that disguises the camera, surreptitiously snap your pic, then close the camera, all before your unsuspecting subject has time to readjust his hairpiece. **Winner: Pocket Digital**

Capacity: Both the DC1300 and Pocket Digital come with just 16MB of internal flash memory, and neither camera has a slot for removable media. This makes the capacity competition a straight-up wash. But we have to report on a sneaky little swindle: At its maximum 1.3-megapixel resolution, the BenQ DC1300 promises 44 pics, while the Pocket Digital has a larger capacity of 53 pics. That's because the Pocket Digital actually takes all of its pics at 640x480, then uses interpolation to achieve the higher res! It's a cheat, and it has a negative effect on image quality, but the Pocket Digital does guarantee a greater number of "high-res" pics. **Winner: Tie**

Features: The DC1300 may be small, but when it comes to features, it's a full house, sporting buttons for things you'd only expect from a high-end camera: macro mode, flash, and white balance adjustments for bright sun, overcast skies, and artificial light. But that's not all: The DC1300 can also record sound and capture AVI video—in theory. We tried to play the camera's AVI video on three different PCs, but it never loaded properly. **Winner: DC1300**

Ease of use: Taking advantage of the DC1300's functionality can be slow going as there are four different buttons on the camera's backside and a veritable slew of interface symbols to memorize. And while the LCD on the DC1300 is three times larger than that on the Pocket Digital, the DC1300's relative abundance of options makes the screen more prone to clutter. Fortunately, the LCD is backlit for greater visibility, a nicety that Logitech neglected. With the Pocket Digital, there's a learning curve of just 30 seconds as you familiarize yourself with a mere five interface symbols. We're not necessarily fans of frugality, but a dearth of bells and whistles sure makes the Pocket Digital easy to operate. We also liked that the PD's viewfinder is slightly larger than the DC1300's. **Winner: Pocket Digital**

Image quality: Both cameras are pimped as 1.3-megapixel, but the DC1300 yields a top resolution of 1280x1024, while the Pocket Digital tops out at 1280x960—and even this resolution is achieved via nasty interpolation. Regardless, neither camera is appropriate for shooting pics to be printed out, so we focused on how well each camera's pics looked onscreen. Under this level of scrutiny, it was clear that the DC1300 was the better shooter. It yielded pics with sharper edges, more vivid colors, and far less artifacting. However, we did notice a green color cast on pics taken with the DC1300 in natural light. Neither camera did well in dim light. **Winner: DC1300**

MAXIMUM PC VERDICT

DC 1300
BEN Q

www.benq.com
$150 (on sale for $100 at press time)

6

Copyrighted material

LOGITECH POCKET DIGITAL

Basic technology: The Pocket Digital owes its incredibly small size to the lithium polymer battery that powers it. The battery's dry composition and flexible casing allow fitment in a very tight space. Plus, the battery is relatively lightweight, USB rechargeable, suffers no memory effect, and lasts for the life of the camera. It's a state-of-the-art technology that's generally found in only high-end electronics (e.g. Apple's iPod), so owners of the modest Pocket Digital are lucky to have it. **Winner: Pocket Digital**

Portability: Boasting the exact dimensions of a stack of nine credit cards, you could easily carry the Pocket Digital in the pocket of any garment, even tight jeans. And with its sturdy construction, you could accidentally sit on it without incident (but, hey, we're not making any promises). Though the BenQ DC1300 has similar dimensions as far as height and width, its girth is three times larger. But the kicker is the Pocket Digital's built-in lens protection; the camera doesn't require any unwieldy carry cases.
Winner: Pocket Digital

Coolness factor: The Pocket Digital's brushed-aluminum surface and stealthy appearance make it look like a serious spy gadget. And, without exception, each member of the *Maximum PC* staff found the Logitech camera to be more visually inspiring than BenQ's competitor. The BenQ DC1300 does come with a lot of extra features, but its design is unimaginative, and its paint job and blue carrying case are, well, juvenile.
Winner: Pocket Digital

Ease of use: With only two buttons (one toggles between a beep sound and a timer, while the other toggles between 640x480 and "1280x960"), the Pocket Digital is a cinch to master. Even light adjustment happens automatically. Meanwhile, the word "intuitive" isn't part of the DC1300's vocabulary. At first, we had trouble even knowing how to hold the camera—despite its physical resemblance to a conventional film camera, the DC1300 is intended to be held at a vertical orientation. D'oh! We could've excused that small matter if we hadn't had such a hideous time figuring out the DC1300's myriad features. For example, although the woefully spartan instruction manual provides a cursory explanation of the Flash button, we couldn't for the life of us get it to generate light. Is the Flash not working, or are we missing some vital piece of information? To this very day, we're still in the dark.
Winner: Pocket Digital

Image quality: While the Pocket Digital's pics somehow managed to eek out accurate color reproduction, they mostly appeared flat and grainy. But what do you expect from a "VGA" CMOS sensor that uses interpolation to hit 1.3 megapixels? Neither camera will be used as a back-up in our digital photo studio, but the DC1300 does inspire more visual-quality confidence than the Pocket Digital. There's really no contest.
Winner: DC1300

Capacity: Like the DC1300, the Pocket Digital is limited to just 16MB of built-in flash memory. Sure, we like the fact that the PD can squeeze out a total of 53 "high-res" pics, but let's not forget that these images are really just 640x480 pics that have been interpolated upward to 1280x960. The capacity battle is a tie, but we really think Logitech should be much more upfront about its interpolation tactics. You have to hunt quite a while before finding mention of them on the camera's product packaging.
Winner: Tie

Features: The Pocket Digital is scantily featured, through and through. You can choose whether the device should make a faint beeping sound when a picture is taken, and you can set it to take a picture after a 10-second delay, but that's it. Autobrite takes the place of White Balance and is implemented at the camera's discretion. When it comes to extras, the Pocket Digital is to the DC1300 what the McDonald's hamburger is to the Big Mac.
Winner: DC1300

MAXIMUMPC VERDICT

Pocket Digital
LOGITECH

www.logitech.com
$130
7

THE UPSHOT

In the end, we have to give it up for the Pocket Digital. Sure, its basic image quality doesn't match the DC1300, but its original design, sturdy construction, easy operation, and lithium polymer battery make up for the interpolation tricks. Plus, it looks cooler than the BenQ camera, and truly screams "spy" when one wants to be the most sneaky. Message to BenQ: Drop all the fancy features, simplify your interface, and reduce your camera's beltline—you could've had an 8.

Copyrighted material

WatchDog

Say hello to **Samwise,**
WatchDog of the Month.

Maximum PC takes a bite out of bad gear

THIS MONTH: The WatchDog goes after...

> Toshiba > Imation > Elsa

Check Your Box at the Door

The Dog has recently received a deluge of complaints from readers who've discovered that their computing purchases contain the wrong hardware or software in the shrink-wrapped packages. The Dog suspects that in most cases it's the work of unscrupulous customers who swap the videocard, CD-R drive, or what have you, then reseal the package before returning it to the store. Of course, it's also possible that the product came from the supplier containing the incorrect part. Since these cases often boil down to the customers' word vs. the stores', The Dog recommends that you check the contents of the package before leaving the store to ensure it contains exactly what you paid for.

Toshiba Sued Over Hot Notebooks

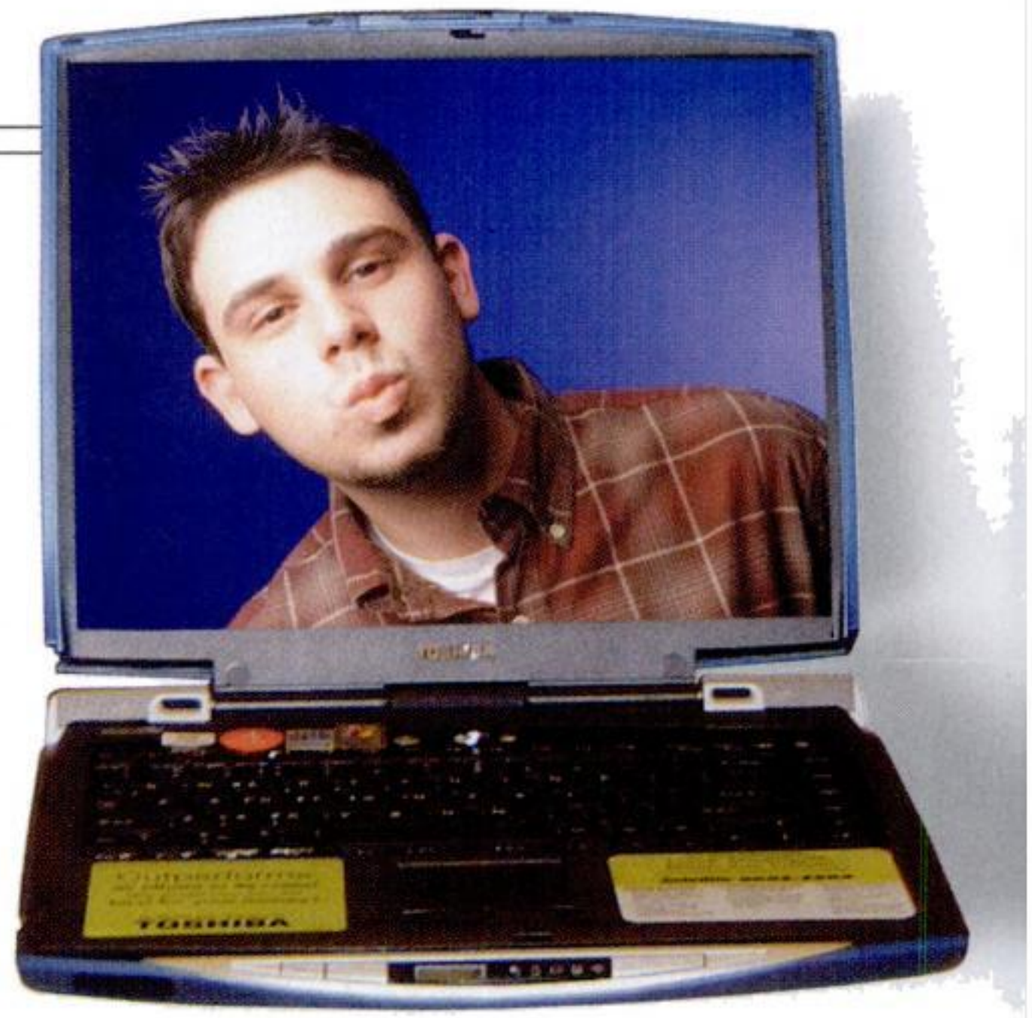
DEAR DOG: I recently purchased a Toshiba 5005-S507 laptop. On paper, the thing is sweet for gaming—1.1GHz Pentium III, 512MB RAM, and a 32MB GeForce4 Go. For the first 30 days or so I was very satisfied with its performance (in fact, it kicked butt). After that, however, I started experiencing lockups while playing my favorite 3D games.

"Toshiba has failed and refused to warn consumers about the common design defect contained in the 5005 series."

After a little research on Toshiba's online forums and the Internet, I learned that other owners of the 5005-S507 have had serious overheating issues. My system always runs hot, but locks up only during heavy CPU/GPU use. Using a hardware monitor, I discovered that the startup CPU temp is around 100° F, but skyrockets to 158° F during a 20-minute gaming stint, at which point it locks up.

Most people on Toshiba's forum have already sent in their systems twice for repair, only to have the problem occur again. Toshiba's "fix" is to apply new thermal grease to the CPU, possibly swap out the mobo/CPU, and flash the BIOS. Here's the kicker: Many users have noticed through benchmarks that the new BIOS underclocks the CPU down to 600MHz! Clearly this isn't what I shelled out $2,000 for.

Customers are suing Toshiba over spontaneous shutdowns of the 5005-S507. Just don't blame the Vede.



I have contacted Toshiba many times looking to return the system and offering to pay an additional $600 for a laptop with a mobile CPU instead of the desktop CPU that's in it, but the company is unwilling to do the exchange. Toshiba reps are also very reluctant to even admit there's a widespread problem. Perhaps those users who haven't experienced a problem just aren't playing games. But clearly there is a problem, as evidenced by the numerous complaints on the company's own support forums as well as others.

I have always believed that Toshiba made quality laptops. I realize there will be problems from time to time, and I can get beyond that. However, Toshiba's lackadaisical customer-service approach really has me doubting that I will ever buy another of its products.

— MIKE WALLACE

THE DOG RESPONDS: Mike Wallace (no, not the *60 Minutes* anchor) was just one of many people who have complained about the Toshiba 5005-S507's sporadic lockups. On July 16th, Toshiba issued its third BIOS, which cranked the CPU back up to speed, but the company reiterated its claim that the lockups and slow-downs have impacted just a few customers. Exactly one week after Toshiba's BIOS update, the Beverly Hills–based law firm of Kiesel, Boucher & Larson filed a class-action suit against Toshiba. The suit, filed in the Central District of the Los Angeles Superior Court on behalf of Anthony Mikhail of California and Li Qi of Rhode Island, alleges that Toshiba "concealed the facts, among others, that the 5005 Series: (a) fails to perform at its advertised 1.1GHz processing speed, rendering it ineffective as a multimedia machine for presentations and gaming; (b) is not reliable for mobile computing, as it overheats and shuts down; (c) is inherently defective and is not of merchantable quality; and (d) does not conform to its advertised performance specifications."

The suit names the S504 and S507 versions of the 5005 notebook as having the same problems and says that even though hundreds complained of the unexpected shutdowns and performance problems, "Toshiba has failed and refused to warn consumers about the common design defect contained in the 5005 series.... Toshiba failed to adequately design, manufacture, and/or test the 5005 Series to ensure that it was free from this defect."

The first BIOS Toshiba released to fix the

Copyrighted material

stretch your imagination

The CRW-F1 With Exclusive DiscT@2 Technology

The Ultimate CD Recorder

Yamaha's all new CRW-F1 is designed to enhance the style of the contemporary computer workstation. Engineered for easy connectivity via ATAPI, FireWire, USB 2.0 and SCSI, the CRW-F1 delivers reliable performance, high quality and top speed CD recording with whisper quiet operation.

Among its long list of impressive new features, CRW-F1's revolutionary DiscT@2™ Laser Labeling System stands out as the world's only laser based "tattoo" system to etch graphics and text onto CD-R discs, eliminating the need for labels. Next, enter the exclusive new Advanced Audio Master Quality Recording System and hear Yamaha's studio quality advantage in your own living room. Add in the industry first Ultra Speed ReWrite, the triple-guarded SafeBurn multitasking technology and the exclusive live recording mode, and you will discover why critics herald the new CRW-F1 as the *most complete* CD Recorder in the World!

So, whether you are a PC user or Mac user, let Yamaha CRW-F1's extraordinary features and technologies take you to a world with infinite possibilities and where stretching your imagination is just the beginning...

YAMAHA

©2002 Yamaha Electronics Corporation, Multimedia Products Division · 6660 Orangethorpe Ave. Buena Park CA 90620 · www.yamahamultimedia.com

Copyrighted material

problem only slowed down the CPU without warning. According to the lawsuit, "The effects of Toshiba's BIOS upgrades can be accurately analogized to owning a high-performance sports car that overheats when it reaches 65 miles per hour and is 'repaired' by limiting its top speed to 35 miles per hour."

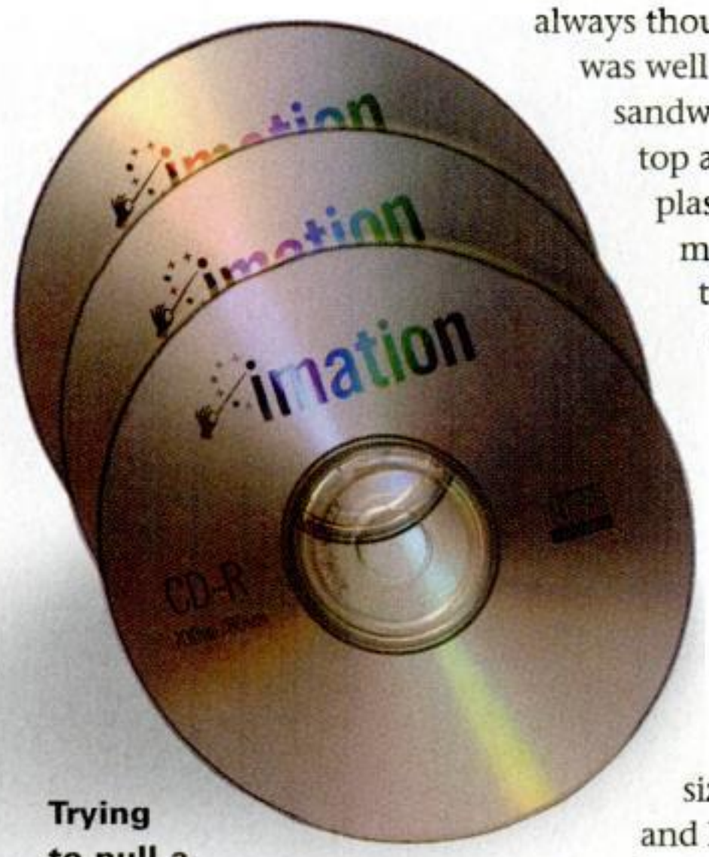
Toshiba officials could not be reached for comment at press time. More information on the suit is available at www.kbla.com/active/case_toshiba.php.

Sticker Shock

DEAR DOG: I am desperate for an answer to this "burning question." I normally buy 3M/Imation CD-R media in 100-disc packs and I label them with a Brother "P-Touch" that puts a half-inch sticker on the disc. Last night, as I was trying to remove a label from a disc with an X-Acto knife, both the sticker and the "top" layer of the CD-R came off, giving me a clear view right through the disc. The top of the CD with the manufacturers brand, logo, etc., is in fact the recording media itself! I was not aware of this. I always thought that the media was well protected and sandwiched between the top and bottom clear plastic of the disc. Am I mistaken in believing that higher-quality discs have the media where it should be? I bought a pack of Philips CD-Rs and they were constructed the same way.

I don't want to shell out for full-size CD-only labels, and I don't think using a marker is such a good idea either, as the solvents in those permanent markers are pretty aggressive—especially over time.

— JEFF MEDIN



Trying to pull a sticker off your CD-R is ill-advised and may destroy the data if you accidentally yank off the disc's top layer.

THE DOG RESPONDS: The Dog contacted Imation for a response to Jeff's burning question. This is what we learned from a company spokesperson: "The construction of all CD discs is essentially the same. It has been defined for all manufacturers in the Philips/Sony Red Book, Yellow Book, and Orange Book standards. This is true of CD-ROM (including prerecorded audio), CD-R, and CD-RW. Basically, a polycarbonate disc is molded with a groove structure, then a dye or thin film layer is applied (for CD-R and CD-RW), followed by a reflector layer and a seal coat. CD discs need to be carefully handled and stored. The bottom surface is subject to contamination and scratches, which can affect the performance. The top surface is also subject to scratches or damage, which as this customer found, can result in complete loss of data."

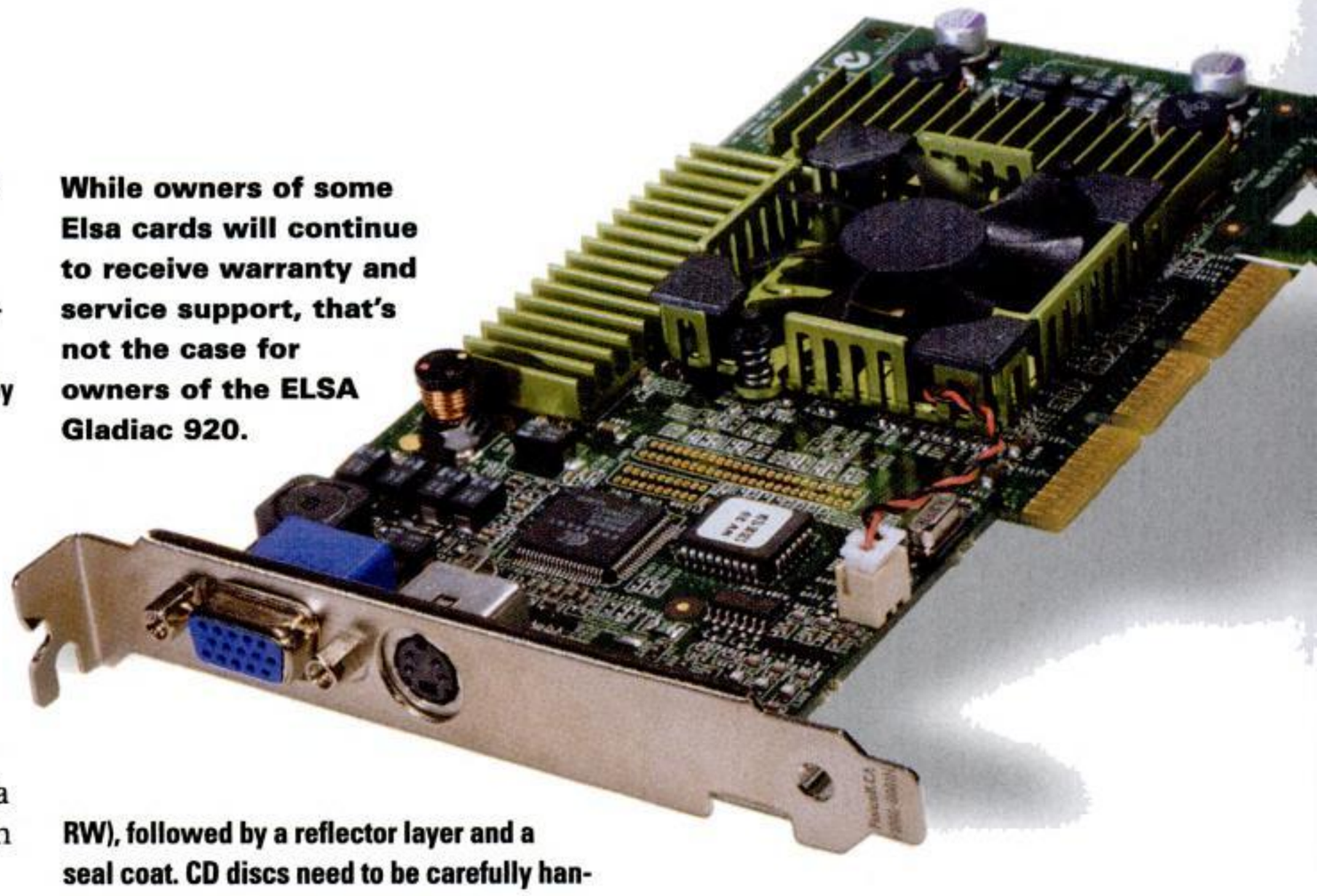
The spokesperson said Jeff was correct to not use a permanent marker, as it can destroy the disc immediately or over time as it seeps into the dye. There are, however, special pens designed to safely write on a disc's surface. In the absence of such a CD pen, a full-size CD label is the best choice. Of course, never try to remove a label even if it's off-center. Doing so may pull off the reflective label and destroy the disc. Instead, Imation recommends that you trim off the excess label, copy the disc to another CD-R, and correctly apply the label to the new disc. It's unwise to label your CD using the P-Touch or any other sticker that's not designed for use on a CD. Just like a car tire, the disc needs to be balanced to hit high speeds. Putting a sticker on the CD may throw it off kilter and make it unplayable at high speeds. More information is available at www.osta.org/technology/cdqa4.htm.

Elsa Pushes up Daisies, PNY Offers Support

DEAR DOG: My last two videocards have been the ELSA Erazor and Gladiac—both fine cards from the German company that makes modems and high-end video solutions. But the company's presence has all but disappeared from the Internet. No one's talking, either. Did Elsa bite the big one and go belly-up?

— MIKE RILEY

While owners of some Elsa cards will continue to receive warranty and service support, that's not the case for owners of the ELSA Gladiac 920.



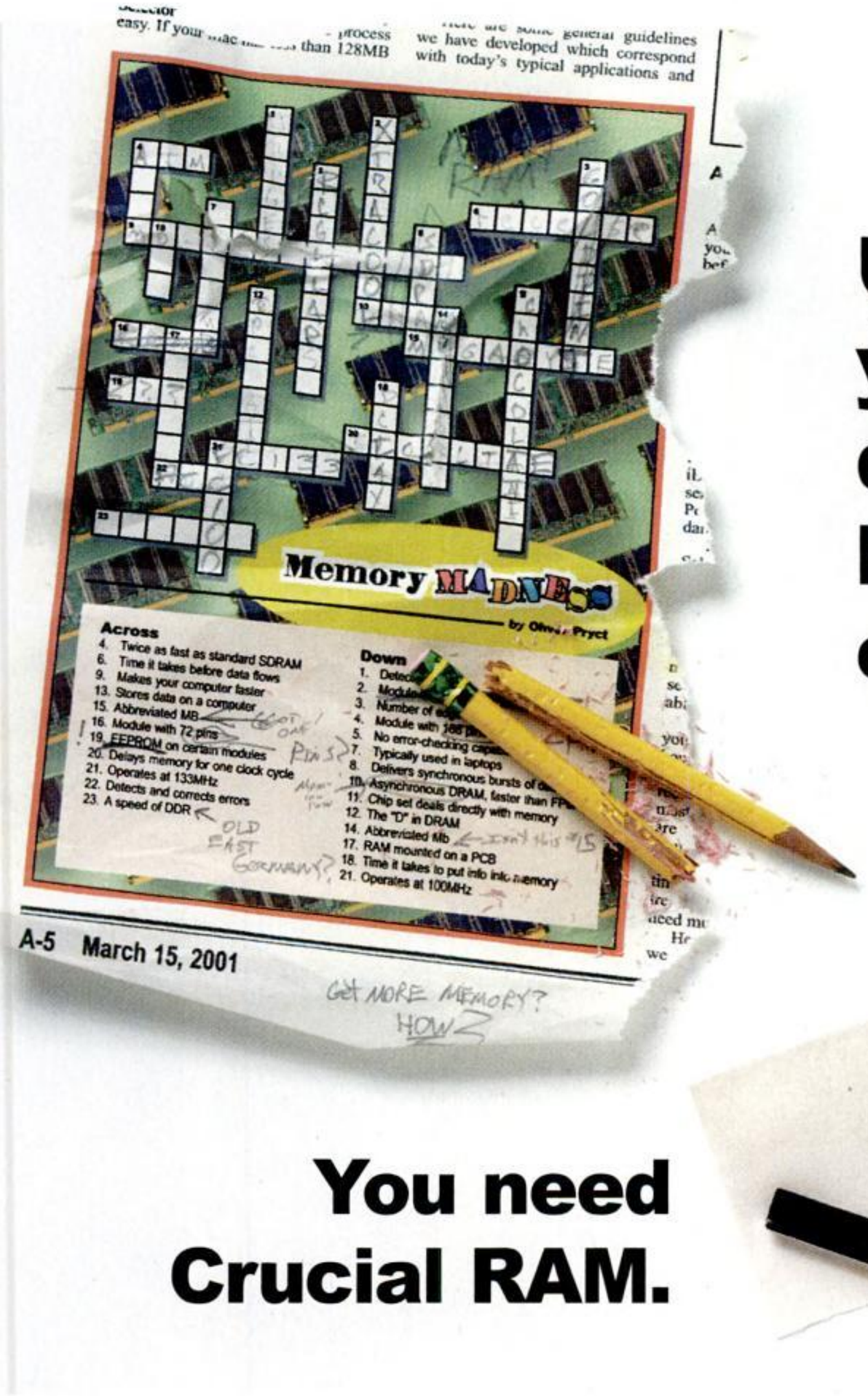
THE DOG RESPONDS: Unfortunately, Mike, Elsa is no more. The German-based company shuttered its doors in May under a cloud of bankruptcy, and most of its assets were liquidated. The closure has left numerous customers in a lurch, with at least one customer reporting that a card he had in for service when Elsa vaporized was never returned. While people with the company's consumer-grade cards such as the GeForce2 and GeForce3 are SOL, competitor PNY has stepped up to offer services to some of Elsa's orphaned customers. People with certain Elsa professional cards will receive discounts for the PNY Quadro4 XGL and Quadro4 750 XGL boards through December 31. Elsa customers with ELSA GLoria III, ELSA Synergy III, ELSA GLoria II, ELSA Synergy II, ELSA GLoria XXL, ELSA GLoria XL, ELSA GLoria MX, ELSA GLoria-L/XL, ELSA GLoria Synergy M4, ELSA GLoria Synergy, ELSA GLoria-S, ELSA GLoria-M, ELSA GLoria-4, ELSA GLoria-8, ELSA Synergy, ELSA GLoria DCC and ELSA Synergy 2000, NVIDIA Quadro2 and NVIDIA Quadro DCC may qualify for discounts.

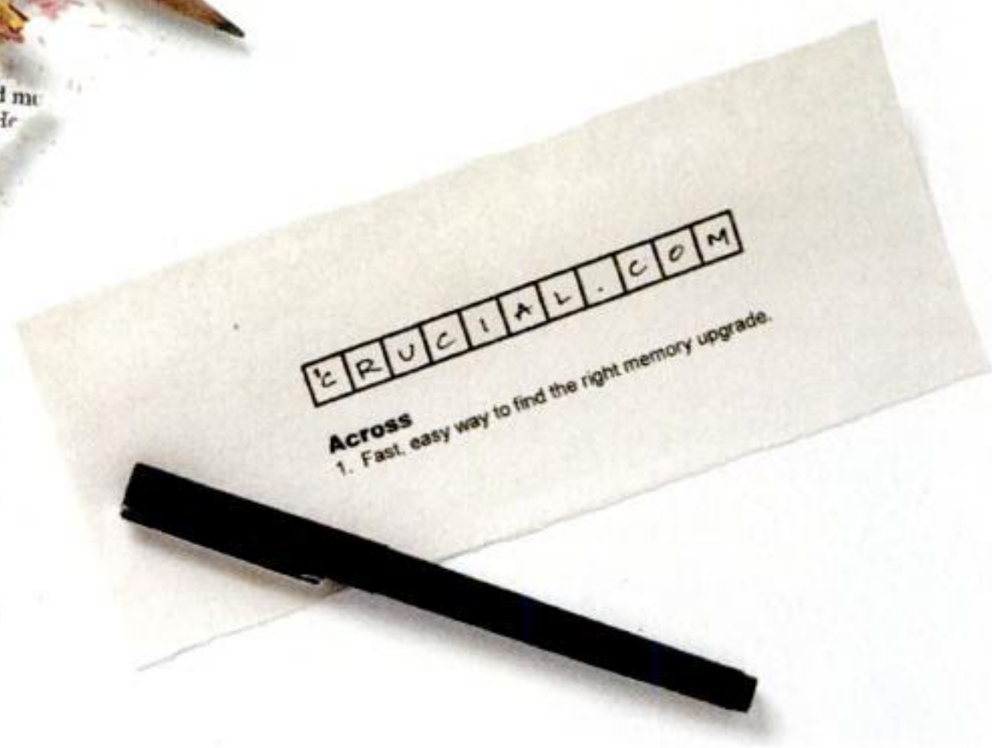
Warranty and service support may also be available for owners of Elsa's professional-level cards. For more information visit www.pny.com/quadro. ■

The closure has left numerous customers in a lurch, with at least one customer reporting that a card he had in for service when Elsa vaporized was never returned.

Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic The Dog on them by writing **watchdog@maximumpc.com**. The Dog promises to get to as many letters as possible, but only has four paws to work with.

Copyrighted material


Memory MADNESS
by Olivia Pryct
Across
4. Twice as fast as standard SDRAM
6. Time it takes before data flows
9. Makes your computer faster
13. Stores data on a computer
15. Abbreviated MB
16. Module with 72 pins
19. EEPROM on certain modules
20. Delays memory for one clock cycle
21. Operates at 133MHz
22. Detects and corrects errors
23. A speed of DDR
Down
1. Detec
2. Module
3. Number of
4. Module with 168
5. No error-checking
7. Typically used in laptops
8. Delivers synchronous bursts of
10. Asynchronous DRAM, faster than FP
11. Chip set deals directly with memory
12. The "D" in DRAM
14. Abbreviated Mb
17. RAM mounted on a PCB
18. Time it takes to put info into memory
21. Operates at 100MHz
A-5 March 15, 2001
GET MORE MEMORY?
HOW?



PC Makers' CHOICE — MORE THAN 94,000 UPGRADES — OVER 15,000 SYSTEMS

SHOPPERS' COMPUTER SHOPPER CHOICE 2001

CIRCLE OF EXCELLENCE

BizRate.com

Upgrading your memory doesn't have to be complicated.

You need Crucial RAM.

Select your system make and model at Crucial.com, and you'll find memory guaranteed to be compatible with your system or your money back. It's that easy! Best of all, you'll get the same top-quality memory the world's leading computer makers install in their systems. Visit Crucial.com and get great memory upgrades at low, direct prices.

$49.49 **256MB PC133 SDRAM**
for today's most popular systems

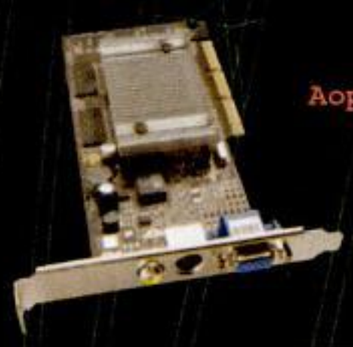
Price reflects an automatic 10% discount for ordering online. Prices may vary according to specific system requirements. The price listed was valid on 8/9/02 when we sent this ad to the publisher; however, prices may have dramatically increased or decreased since then. Visit the FAQ section of Crucial.com to learn more about why memory prices go up and down.

©2002 Micron Technology, Inc. All rights reserved. The Memory Experts is a service mark and Crucial Technology, the Crucial logo and Micron are registered trademarks of Micron Technology, Inc. All other brands and names used herein are the property of their respective owners.
Crucial Technology is a division of Micron Semiconductor Products, Inc., which is a wholly owned subsidiary of Micron Technology, Inc. Phone 208-363-5500. Fax 208-363-5501. E-mail crucial.sales@micron.com. Crucial Technology is not responsible for omissions or errors in typography or photography.

Order online:
www.crucial.com
or call toll-free 1-888-363-5154

crucial™ TECHNOLOGY
A Division of Micron
The Memory Experts℠

Copyrighted material



Aopen G4FMX-420-V64

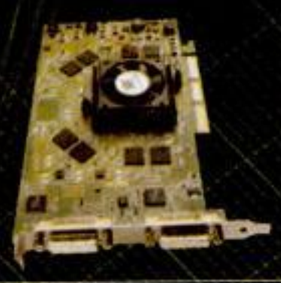
ATI Radeon 9700 Pro

ATI Radeon 9000 Pro

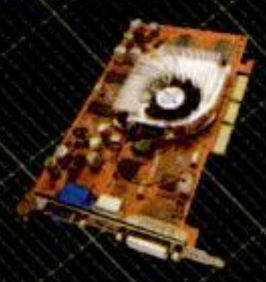
Chaintech A-G440

Hercules 3D Prophet 4500

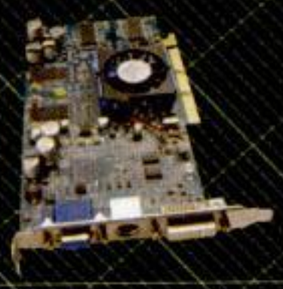
Leadtek WinFast A250 Ultra



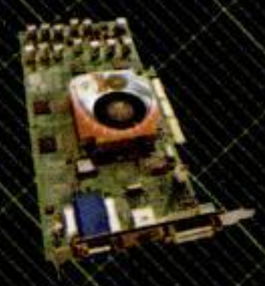
Matrox Parhelia



MSI G4Ti4200-VTD64



Tyan Tachyon G9000 Pro



Visiontek Xtasy GeForce4 Ti

Alienware
Area-51

Falcon
Northwest
Mach V

Exotix

Voodoo PC EGAD

Copyrighted material

HARDCORE Gaming Hardware

Let's get real: No other consumer application is quite so demanding as the modern 3D game. Titles like *Jedi Outcast* and *Dungeon Siege* require the most advanced CPUs, the fastest videocards, and memory galore. Hardware requirements will only become stricter in the next 18 months, so let's all start now in the battle against PC obsolescence. Throughout the next 19 pages, we dig deep—way deep—into the gaming hardware scene, and show you just what you'll need for the best PC gaming experience possible.

We benchmark and blueprint the hardware configurations you'll need for the next wave of PC gaming

Our tour starts with a look at three ultimate gaming rigs. They're fast as hell and oh-so-presentable for weekend LAN parties. And even if you're not in the market for buying one of these high-priced behemoths, you can still use these systems as blueprints for your own building projects. In fact, let this article serve as the definitive answer to the question most often sent to *Maximum PC's* inbox: "I want to configure the biggest, baddest gaming system possible—what parts should I buy?"

We next give you the ultimate videocard showdown—complete benchmark reports on every relevant 3D chip available today. Wondering how many frame rates you'll gain by upgrading from a Ti 4400 to a Ti 4600? *You will find the answer inside.* We even benchmark crappy videocards, if only to put truly stunning performance in proper perspective.

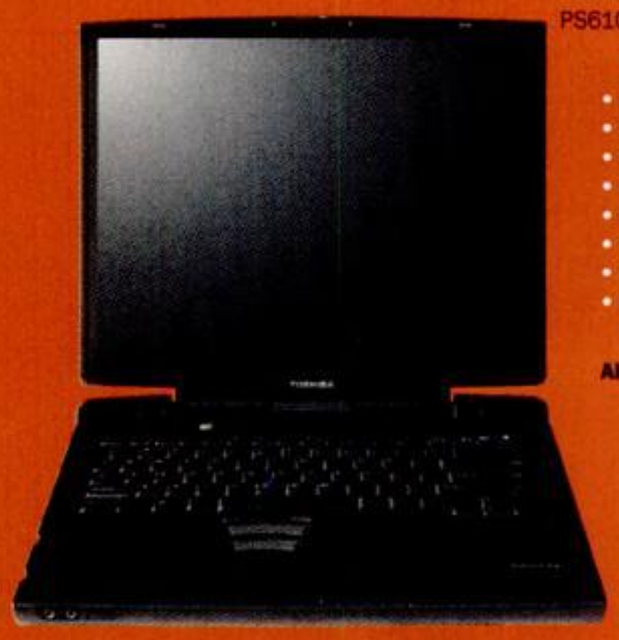
Our tour ends with a vivid look at next-generation game engines—the polygon-and-bitmap lovefests that compel us to upgrade, upgrade, upgrade. Once you see these new titles in action, even *Quake III* will look like a crudely rendered N64 game. A new era of PC gaming graphics is just around the corner, and it is absolutely breathtaking. Prepare to be amazed.

Copyrighted material

Mobilize Your Business.

Get a 0% lease, $0 down and no payments for 30 days on all notebooks.[1]

Experience the ultimate power and performance of the Mobile Intel® Pentium® 4 Processor - M.



Satellite Pro®

Lose the desktop.

Satellite Pro® 6100 | $2,699

PS610U-JM3N89

0% Business Lease $90/mo.[1]

- Mobile Intel® Pentium® 4 Processor 2.0GHz - M
- 512MB of RAM
- 60GB[2] hard disk drive
- DVD-ROM/CD-RW multifunction drive
- 15.0" UXGA active matrix display
- Integrated Ethernet, modem and Wi-Fi
- NVIDIA® GeForce4™ 420 Go graphics controller
- Microsoft® Windows® XP Professional or Windows® 2000 dual linked

Satellite Pro® 6100 | $2,299

PS610U-JHN849

0% Business Lease $77/mo.[1]

- Mobile Intel® Pentium® 4 Processor 1.80GHz - M
- 256MB of RAM
- 60GB[2] hard disk drive
- DVD-ROM/CD-RW multifunction drive
- 15.0" SXGA+ active matrix display
- Integrated Ethernet, modem and Wi-Fi
- NVIDIA® GeForce4™ 420 Go graphics controller
- Microsoft® Windows® XP Professional or Windows® 2000 dual linked

Satellite Pro® 6100 | $1,899

PS610U-024K19

0% Business Lease $63/mo.[1]

- Mobile Intel® Pentium® 4 Processor 1.70GHz - M
- 256MB of RAM
- 40GB[2] hard disk drive
- DVD-ROM/CD-RW multifunction drive
- 14.1" XGA active matrix display
- Integrated Ethernet and modem
- NVIDIA® GeForce4™ 420 Go graphics controller
- Microsoft® Windows® XP Professional or Windows® 2000 dual linked
- Easy upgrade to wireless available

Also available: the Toshiba Small Business Series with Microsoft® Office XP

Performance on the go with the Mobile Intel® Pentium® III Processor - M.

Portégé®

Fits almost anywhere.
Does almost anything.

Portégé® 2000 shown.
Other models may vary.

Portégé® 2000 | $1,999

PP200U-0000G9

0% Business Lease $67/mo.[1]

- Mobile Intel® Pentium® III Processor 750MHz - M
- 256MB of RAM
- 20GB[2] hard disk drive
- 12.1" polysilicon TFT active matrix display
- Integrated Ethernet, modem and Wi-Fi capabilities
- Microsoft® Windows® XP Professional
- World's thinnest notebook

Portégé® 4010 | $2,149

PP401U-0217C9

0% Business Lease $72/mo.[1]

- Mobile Intel® Pentium® III Processor 933MHz - M
- 128MB of RAM
- 20GB[2] hard disk drive
- DVD-ROM/CD-RW multifunction drive
- 12.1" polysilicon TFT active matrix display
- Integrated Ethernet, modem and optional Wi-Fi capabilities
- Microsoft® Windows® XP Professional

Satellite®

Top-level performance. Low-level price.

Satellite® 2400-S251 shown. Other models may vary.

Satellite® 2400-S251 | $1,699

PS240U-02S4H7

0% Business Lease $57/mo.[1]

- Mobile Intel® Pentium® 4 Processor 1.70GHz - M
- 256MB of RAM
- 30GB[2] hard disk drive
- DVD-ROM/CD-RW multifunction drive
- 15" TFT active matrix display
- Integrated Ethernet and modem
- Microsoft® Windows® XP Professional

Satellite® 2400-S201 | $1,529

PS240U-00UMR7

0% Business Lease $51/mo.[1]

- Intel® Pentium® 4 Processor 1.60GHz
- 256MB of RAM
- 30GB[2] hard disk drive
- DVD-ROM/CD-RW multifunction drive
- 14.1" TFT active matrix display
- Integrated Ethernet and modem
- Microsoft® Windows® XP Professional

Satellite® 1100-S101 | $1,199

PS110U-000G27

0% Business Lease $40/mo.[1]

- Intel® Celeron® processor 1.33GHz
- 256MB of RAM
- 20GB[2] hard disk drive
- DVD-ROM
- 14.1" TFT active matrix display
- Integrated Ethernet and modem
- Microsoft® Windows® XP Professional

Also available: the Toshiba Small Business Series with Microsoft® Office XP

***PC Magazine*'s 15th Annual Reader Survey – August 2002**

Toshiba Notebooks' Service and Reliability: Rated "A"

1-888-488-2835 | shoptoshiba.com

Buy direct from Toshiba or from your local reseller. Code 26H1.

The world's best selling notebooks.

TOSHIBA

Three months of AOL membership included with the purchase of a Toshiba Satellite® or Satellite Pro.®[3]

Toshiba Recommends Microsoft® Windows® XP Professional for Mobile Computing.

[1]30-month lease offer with fair market value end-of-term purchase option available through Toshiba America Information Systems, Inc. to qualified commercial business customers only. Each lease subject to credit approval, acceptable documentation, 10% soft cost limit & order of Toshiba computer products of $1,500 up to $100,000 (exclusive of taxes, fees & shipping). Rates quoted do not include taxes or shipping. Offer available in the United States only, valid only until 9/30/02 and may be withdrawn or changed at any time without notice or obligation. Other terms and conditions apply. For full description of terms and conditions call 1-800-207-8362 or go to www.zerolease.toshiba.com. [2]GB means one billion bytes. [3]AOL OFFER DETAILS: Availability may be limited, especially during peak times. TO AVOID BEING CHARGED A MONTHLY MEMBERSHIP FEE, SIMPLY CANCEL BEFORE THREE-MONTH PROMOTIONAL PERIOD ENDS. Premium services carry surcharges, and communication surcharges may apply, including in AK, even during promotional period. Members may incur telephone charges on their phone bill, depending on their location and calling plan, even during promotional period. Available to new AOL members in the United States, age 18 or older; a major credit card or checking account is required. © 2002 Toshiba America Information Systems, Inc. Satellite, Satellite Pro and Portégé are registered trademarks of Toshiba America Information Systems, Inc. Intel, the Intel Inside logo, Celeron and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States or other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries. All other products and names mentioned are the property of their respective owners. All pricing, offers, software and specifications subject to change. Reseller prices may vary. All rights reserved.

Copyrighted material

Gaming Rig Showdown

Three Elite PCs Square Off in a Battle of Frame Rates and Style

Hardcore. The best of the best. *O.G.* In the wide scope of PC manufacturers, that's how we'd describe Alienware, Falcon Northwest, and Voodoo PC. We challenged these three "boutique" PC vendors to send us their very best gaming machines, and we weren't disappointed by what we received. Each box came with the most exotic parts available, power-tweaks galore, and out-of-this world stylings. What you'll see on the next eight pages should blow your friggin' minds.

But what separates these three gladiators from each other? Hell, when it comes down to pure hardware configs, what separates an Alienware system from, say, a Dell or HP? What makes a Falcon or a Voodoo a *gaming* system and not just another supercharged power box with a pretty paint job? Well, for starters, each of the rigs in this article came with an impossible-to-get ATI Radeon 9700 Pro videocard. Very nice, considering every other PC vendor on the planet was trying to pimp us overclocked GeForce4 Ti 4600 cards. Read on for all the pertinent details on the world's most exotic gaming rigs.

Copyrighted material

Falcon Northwest Mach V Exotix

We almost expected to find a leather bomber jacket bundled in the box

FALCON NORTHWEST

PRICE: $7,790

www.falcon-nw.com

Falcon defines the term "gaming PC":

"Today, any bozo can slap in a GeForce4 and claim he's got the best PC for gaming. And many bozos have. So, now, a true "gaming PC" comes down to the system builder's skill at assembling the parts, and the company focus: Whom does the company serve? Do they care how *Morrowind* runs on your PC, or is that just another software app to them? We believe our gaming PC is no longer defined by the hardware. It's defined by company vision."

Translation: Trust us—we've been doing this for years.

Don't even think about calling it the "Memphis Belle." This retro Mach V PC actually sports nose art from a B-24 Liberator, the WWII bomber that flew in more theaters of operation than the famous B-17.

Though the outside of this machine screams retro aircraft, the inside is state-of-the-art F-22 Raptor, and damned near as fast. A 2.8GHz P4 is the brains of the operation, and Falcon opted for the performance-oriented Asus P4T533-C motherboard with 1GB of PC1066 strapped into the slots.

In the storage arena, Falcon gave us its standard duo: a 40x Plextor CD-R drive and a Toshiba 16x DVD drive. But in the hard drive subsystem, the company went way over the top: four Western Digital WD1200JB drives (each with 8MB cache), striped together in a RAID 0 config and connected with a Promise FastTrack ATA133 controller. Four drives, 480GB of total storage. Extreme!

The Promise RAID controller may not be able to use all its speed capacity during data bursts (the drives, after all, are "just" ATA100), but when you're running nearly any modern four-spindle RAID array, you get disk access speeds to die for. We ran the ATTO hard drive benchmark on the array and saw transfer rates peaking in the 92MB/sec range. How would you like that kind of performance to load your *DOOM III* levels? We probably would've seen even more performance if there wasn't a bug in the Intel 850e chipset that puts a speed limit on PCI traffic.

Hot damn: The Radeon 9700 Pro's BGA memory gets hotter than a .50-caliber barrel, so Falcon outfitted its card with chromed heatsinks.

In the audio department, Falcon tapped Creative Labs' Audigy Platinum Ex soundcard and Klipsch's 5.1 speakers—no shocker there. The Ex version of the Audigy includes an external breakout box that features various analog, optical, and FireWire ports. It's no wonder that all three machines in this roundup included the same speaker set and essentially the same soundcard. It's an awesome combination that's damned hard to argue against, but we're starting to wonder if there isn't some type of "audio mafia" that's keeping the competition out. Either way, you'll find no complaints from *Maximum PC* (at least when it comes to audio playback in gaming).

One thing that never gets dull is Falcon's choice of CRTs: The company shipped Sony's GDM-FW900. With 24-inches of screen real-estate, this aperture-grille behemoth is among the biggest *and* best you can buy. We prefer the 21-inch Sony F520 because its pure image quality is a bit better, but we respect the fact that Falcon wanted to drop a Big Boy on us.

The big Sony won't be without content, as Falcon managed to snag a just-off-the-foundry ATI chip at the last minute. Hats off to Falcon for having the industry connections to pull off the coup, because arriving to this showdown with a GeForce4—even a heavily overclocked GeForce4—would've been like showing up to World War II with the 3rd Cavalry from *F Troop*. However, unlike the other two competitors, Falcon didn't overclock its Radeon 9700, and as a result, the Mach V couldn't keep pace in most of our benchmarks. Still, the Falcon's collective performance was just about two percentage points off the mark, so we won't mock the company for its clocking decision.

The Mach V Exotix's paint job is among the best

Let's Judge Aesthetics

Here's what our editors thought of Falcon's ambitious WWII theme:

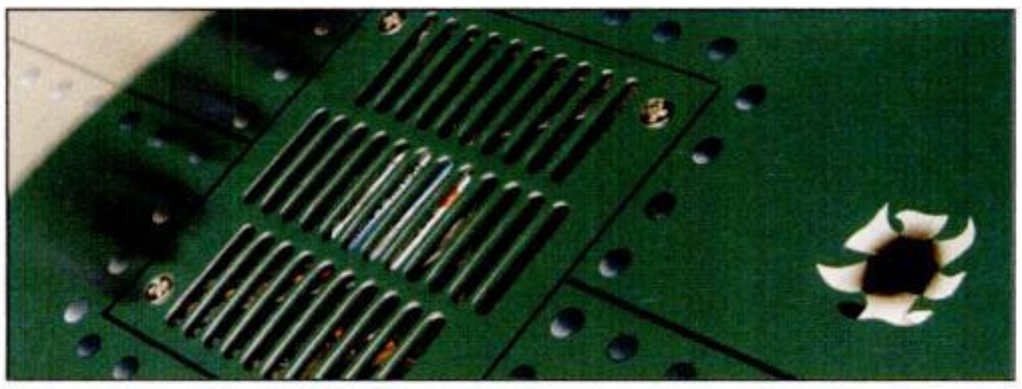
JON: Perfect paint job, and I love the idea of a WWII-themed machine, but I think the artist went just a few ticks too far. The camo swatches are too dominant, and the numbers are too big. They overshadow the awesome nose art. But who knows, maybe the design is military-correct.

WILL: Not my cup of tea, but undoubtedly the best paint job in the roundup.

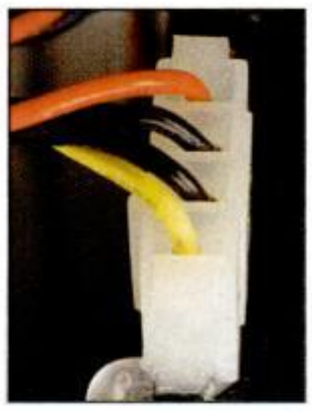
LOGAN: Overkill. Looks spastic to me. I'd take Voodoo's simple, luscious red any day.

GORDON: What can I say, I love it. The case makes me daydream of big bombers lumbering off a foggy English airfield.

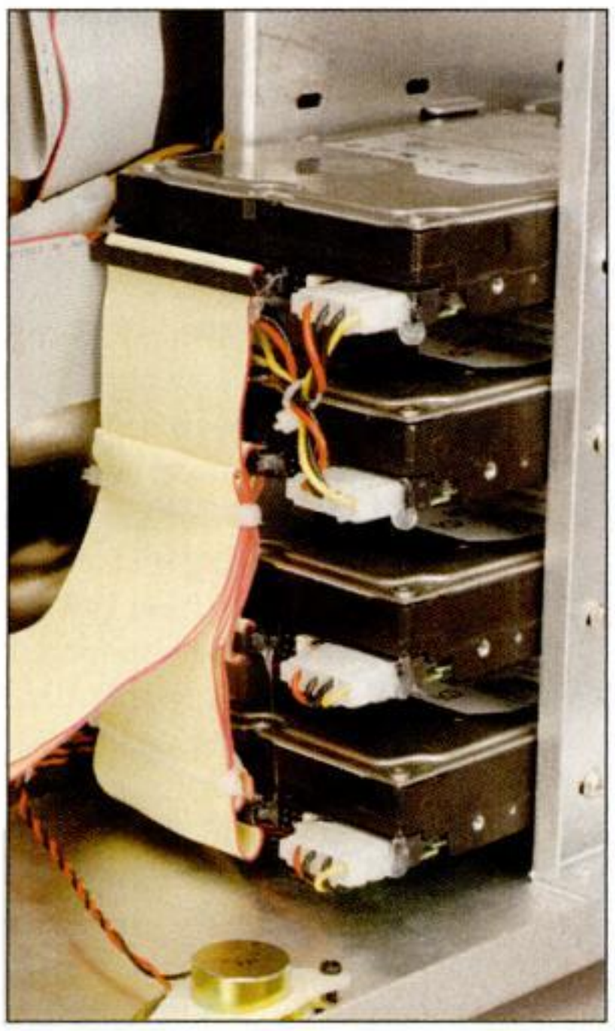
Copyrighted material



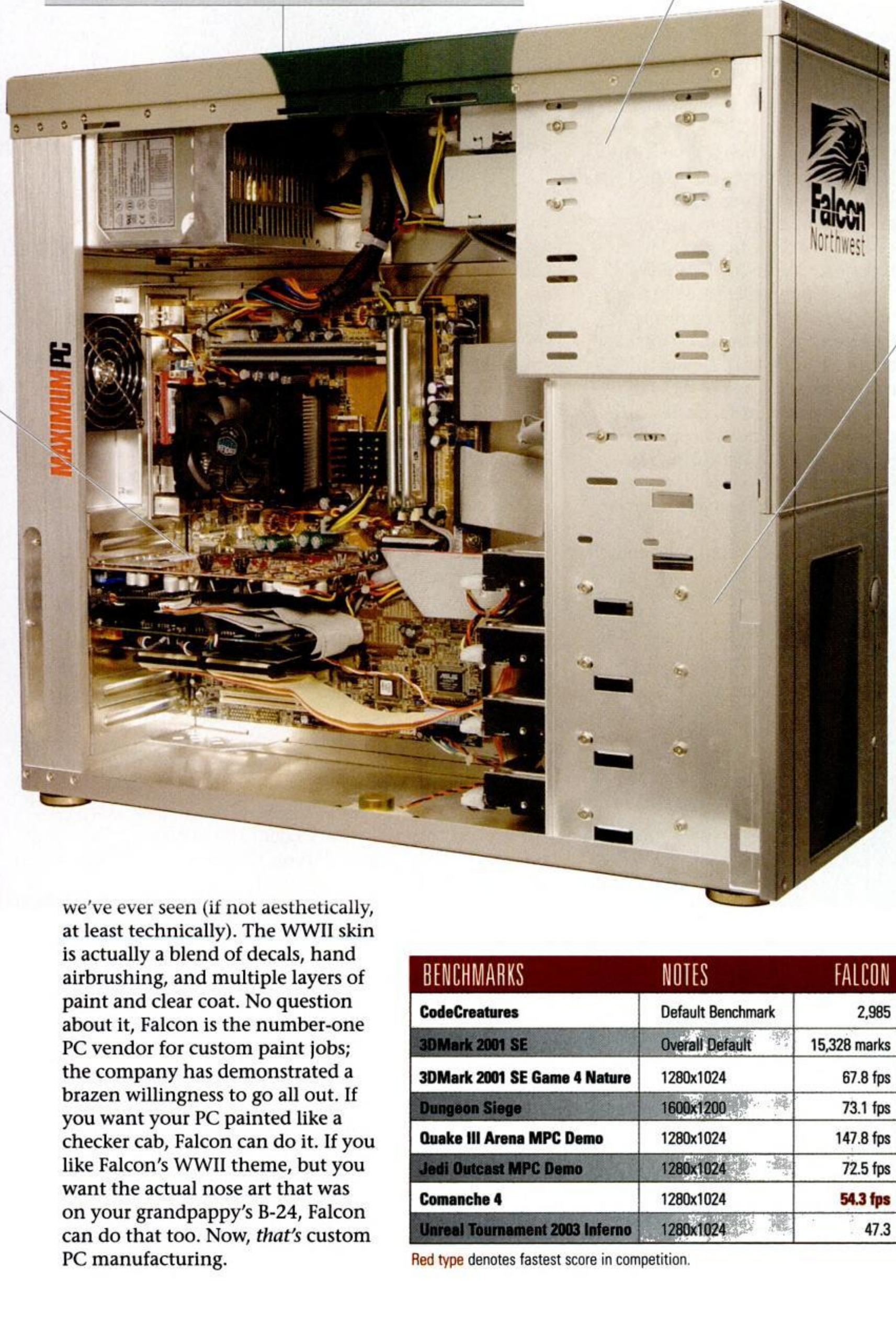
Still flying: Hand-painted smoke and a few bullet holes give the Mach V that "50 mission crush" look.



Glued shut: Dabs of glue keep power cables and IDE cables from shaking lose during particularly rough transports.



Maximum RAID: Four 120GB hard drives give the Falcon almost half a terabyte of storage and ultra-fast read speeds.



we've ever seen (if not aesthetically, at least technically). The WWII skin is actually a blend of decals, hand airbrushing, and multiple layers of paint and clear coat. No question about it, Falcon is the number-one PC vendor for custom paint jobs; the company has demonstrated a brazen willingness to go all out. If you want your PC painted like a checker cab, Falcon can do it. If you like Falcon's WWII theme, but you want the actual nose art that was on your grandpappy's B-24, Falcon can do that too. Now, *that's* custom PC manufacturing.

BENCHMARKS	NOTES	FALCON
CodeCreatures	Default Benchmark	2,985
3DMark 2001 SE	Overall Default	15,328 marks
3DMark 2001 SE Game 4 Nature	1280x1024	67.8 fps
Dungeon Siege	1600x1200	73.1 fps
Quake III Arena MPC Demo	1280x1024	147.8 fps
Jedi Outcast MPC Demo	1280x1024	72.5 fps
Comanche 4	1280x1024	**54.3 fps**
Unreal Tournament 2003 Inferno	1280x1024	47.3

Red type denotes fastest score in competition.

UNDER THE HOOD

THE BRAINS	
CPU	2.8GHz Intel Pentium 4
Mobo	Asus P4T533-C
RAM	1GB PC1066 RDRAM
I/O ports	Four USB 2.0, three FireWire, PS/2 mouse, PS/2 keyboard, parallel port, two serial ports, mic input, VGA, DVI, three analog out, digital audio out, digital audio in
LAN	Onboard 10/100Mbps Intel Ethernet
DISPLAY	
Videocard	ATI Radeon 9700 Pro
Monitor	24-inch Sony GDM-FW900
STORAGE	
Hard drives	Four 120GB Western Digital WD1200JB in RAID 0 with a Promise TX2000 RAID controller
DVD-ROM	Toshiba SD-M1612 DVD-ROM (16x)
CD-RW	Plextor PlexWriter 40/12/40A (40/12/40)
FINE DETAILS	
Case	CoolerMaster ATC-110
Fans/extras	Four 80mm fans, custom paint job, Enermax EG465P-VE (431 watt)
Mouse	Microsoft Intellimouse Explorer 3.0 USB
Keyboard	Microsoft Internet Keyboard Pro
SOUND	
Soundcard	Sound Blaster Audigy Platinum Ex
Speakers	Klipsch ProMedia 5.1
BUNDLE	
Windows XP Home, Roxio *Easy CD Creator 5.0*	
BOOT: 59 sec.	**DOWN: 8 sec.**

Copyrighted material

Alienware Area-51

Swift and shiny, the Area 51 still abducts the competition

ALIENWARE

PRICE: $4,600

www.alienware.com

Alienware defines the term "gaming PC":

"Our gaming PC is the evolvement of years of supporting hardcore gaming customers and getting their feedback. It's all about performance without sacrificing stability. The specs in terms of hardware are the latest in cutting-edge technology, but with a special emphasis on reliability, which is important to long online gaming sessions."

Translation: That's why they went with a safe Intel mobo and are so obsessed with tech support.

There's a scary conspiracy theory floating around the Internet bulletin boards these days: Alienware has been co-opted by the Men in Black, and now has aspirations to become as mainstream as Dell and HP.

Conspiracy nuts point to the fact that Alienware PCs are being sold at—gasp!—Best Buy. Connect the dots, people! The *New York Times*, that most "New World Order" of all newspapers, even recently published a story about Alienware's financial success. The clues are self-evident: *Alienware has been compromised.*

Fortunately, we have good news for true believers. The wild theorizing is bunk. Alienware is firmly committed to its original mission of building ultimate gaming machines.

The Area-51 that the company beamed us is a no-apologies rig. Inside we discovered the hot new 2.8GHz P4 and 512MB of PC1066 mated to an Intel D850EMV2 motherboard. The RAM count is low compared to the other two rigs, but Alienware was the only company to include a DVD burner—Pioneer's DVR-A04 DVD-R drive, a very nice complement to Plextor's 40x CD burner. For hard drive duties, Alienware striped a pair of Western Digital WD1200JB drives using a 3Ware Escalade RAID card. This controller coughed up impressive read speeds in the 80MB/sec range—just shy of the 92MB/sec mustered by Falcon's four-drive array. Alienware also managed to snag an ATI Radeon 9700 Pro card, then summarily overclocked it to 330/330.

The last time Alienware submitted a system, the company went way, way over top with an Apple Cinema HD display—an extremely expensive LCD panel that would be horribly wrong for a gaming rig. This time, the company shot a little lower and submitted a 20-inch viewable, flat-screen NEC FE1250+. Normally this 0.24mm grille pitch CRT would shine, but in this roundup, it's just average. In the audio department, Alienware shipped a Creative Labs Sound Blaster Audigy Platinum with the obligatory Klipsch ProMedia 5.1 speakers. (Once again Creative Labs silicon is teamed up with Klipsch enclosures—now that's the *real* conspiracy.)

Get a grip: Alienware includes a GearGrip Pro bag to help you transport your goodies to LAN parties. A nice touch for hardcore gamers.

But wait: Why an Intel board, and why such an unspectacular wiring job? Both attributes scream sellout. Alienware said it went for the Intel mobo because of its reliability factor—when you sell as many PCs as Alienware does, you start to see more, shall we say, "issues" with non-Intel motherboards. So the Intel decision was a nod to customers who value reliability over tweakability. As for eschewing a fancy wiring job, Alienware said it used to ship wiring jobs similar to those of the competition, but stopped after customers began complaining that neatly folded IDE cables were a bitch to deal with during drive swaps.

Hmmm. Sounds a bit "convenient," right? We were beginning to think maybe Alienware *had* gone mainstream, but then we removed our tinfoil hats and ran the benchmarks. Again, all three machines boasted the exact same CPU and videocard architectures, and no single rig emerged as a true frame rate winner, but the Area-51 did crank out the best overall scores in four of our eight tests. Oddly, the rig couldn't even run *Jedi Outcast*—not with the drivers Alienware originally shipped, nor with the ones provided by ATI for our 9700 review on page 68. We also tried clocking the card back to its stock speeds, and swapped it out with another Radeon 9700 Pro—still no luck. Eventually, after troubleshooting the dilemma with ATI and Alienware, we concluded that the 3Ware RAID card may have been to blame. Alienware told us an identical machine in its lab ran the game fine and spit out competitive scores. Alienware offered to send us a replacement PC that would run the test, but the plan wouldn't fit with our deadline. Here's the upshot: Anytime we get an OEM rig that can't run one of the world's most popular

Let's Judge Aesthetics

Here are our autopsies of Alienware's insides and outs:

JON: You sure as hell better like Alienware branding, because it's pressed directly into the case! Very nice paint job, though, and I dig the signature fan grille. I also think the IDE cabling is just fine as it is. This would be my second choice for aesthetics.

WILL: It's the blandest of the bunch—but I really only care about the components inside.

LOGAN: Dusky and sinister—I'd abduct it.

GORDON: Last year, Alienware had the coolest paint job. But now, even with improved glossy paint, it looks boring next to the Falcon and Voodoo.

Copyrighted material

Mighty mouse: Alienware's signature painted Microsoft Intellimouse gets a bump from the old 2.0 version to the new 3.0 version.

Double burners: A DVD-R/RW drive and 40x PlexWriter give you plenty of methods to burn your media. No other rig came with a DVD burner.

Cool gray: Alienware was the only vendor that decided not to equip its video RAM with a heatsink. But the Area-51 was also the only rig in the roundup that had a blow-hole for moving air across the videocard.

games, we get worried. But we also have faith in Alienware's warranty and support mechanisms, and we're confident the *Jedi Outcast* glitch would be addressed in a real-world, consumer scenario. If you ever experience otherwise, let us know.

The Area-51 might be the least expensive machine in the bunch, it might come with a conservative Intel mobo, and it might even come with a 24/7 phone support agreement—how newbie is that? But the sheer audacity of the system is still hardcore.

BENCHMARKS	NOTES	ALIENWARE
CodeCreatures	Default Benchmark	**3,081**
3DMark 2001 SE	Overall Default	15,366 marks
3DMark 2001 SE Game 4 Nature	1280x1024	**71.0 fps**
Dungeon Siege	1600x1200	**78.6 fps**
Quake III Arena MPC Demo	1280x1024	146.6 fps
Jedi Outcast MPC Demo	1280x1024	WNR
Comanche 4	1280x1024	54.0 fps
Unreal Tournament 2003 Inferno	1280x1024	**49.7 fps**

Red type denotes fastest score in competition.

UNDER THE HOOD

THE BRAINS	
CPU	2.8GHz Intel Pentium 4
Mobo	Intel D850EMV2
RAM	512MB PC1066 RDRAM
I/O ports	Three USB 2.0, two FireWire, PS/2 mouse, PS/2 keyboard, parallel port, two serial ports, mic input, VGA, DVI, three analog out, digital audio out, digital audio in
LAN	Intel Pro/1000 MT Gigabit Ethernet
DISPLAY	
Videocard	ATI Radeon 9700 Pro (330 core/ 330 memory)
Monitor	NEC FE1250+ 22-inch
STORAGE	
Hard drives	Two 120GB Western Digital WD1200JB in RAID 0 using a 3Ware Escalade RAID card
DVD-R	Pioneer DVR-A04 burner
CD-RW	Plextor PlexWriter 40/12/40A (40/12/40)
FINE DETAILS	
Case	Chieftec Dragon
Fans/extras	Five 80mm fans, custom paint job, Enermax 550 watt power supply
Mouse	Microsoft Intellimouse Explorer 3.0 USB
Keyboard	Microsoft Internet Keyboard PS/2
SOUND	
Soundcard	Sound Blaster Audigy Platinum
Speakers	Klipsch ProMedia 5.1, Sennheiser RS85 headphones
BUNDLE	
Windows XP Professional, *Easy CD Creator 5.0*, *CyberLink DVD*, Pioneer *RecordNow DX*, Sonic *My DVD 3.0*	
BOOT: 36 sec.	**DOWN: 15 sec.**

Copyrighted material

Voodoo PC EGAD

A "budget" PC in name only

VOODOO PC

PRICE: $5,000

www.voodoopc.com

Voodoo defines the term "gaming PC":

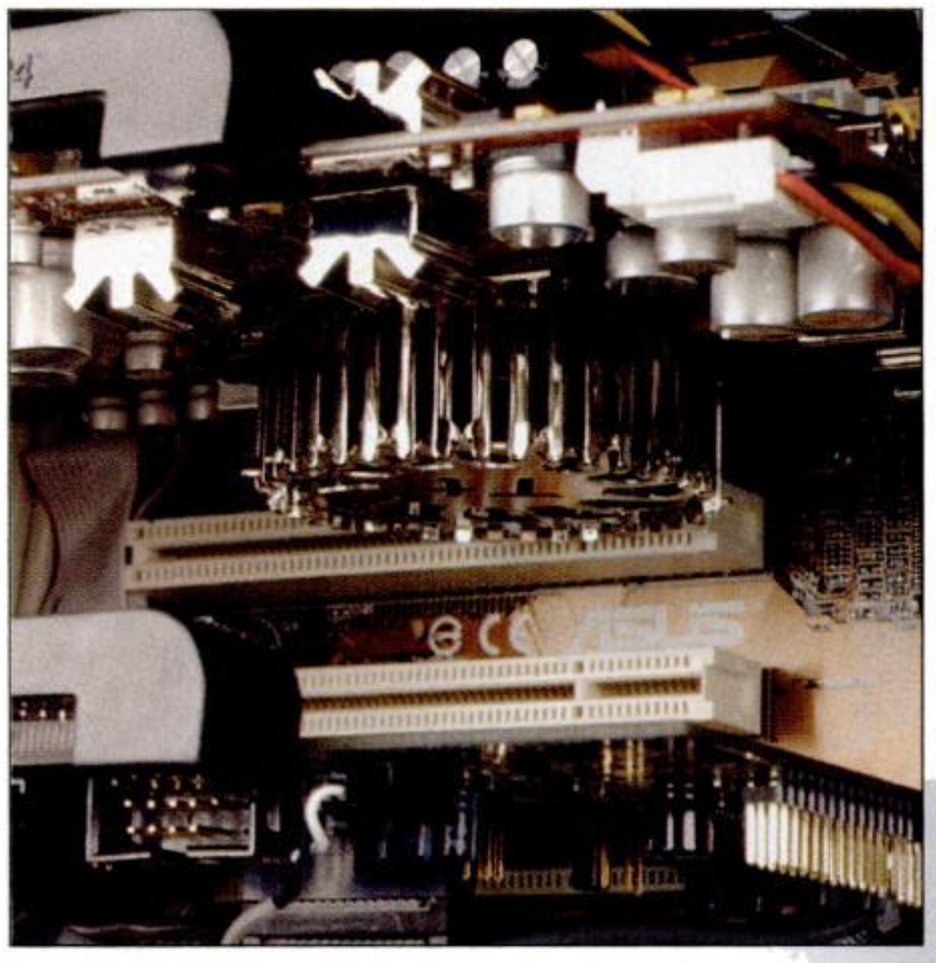
"Our OS and driver base has been optimized for the needs of the gaming community. We chose the fastest possible CPU and videocard on the planet, then we optimized them even further. In terms of sex-appeal, this EGAD is all new. The selection of colors, the Eye-of-the-Storm window design, the Chromacoated interior, and the chassis construction have been completely redesigned for gamers' enjoyment."

Translation: Gamers want overclocking and case windows, and Voodoo's happy to oblige.

When Voodoo PC told us that it wasn't going to ship us the top-of-the-line F-Class system, we were surprised. Who, after all, sends "just second best" to a competition like the Ultimate Gaming Rig Showdown? Well, our skepticism was laid to rest after we uncrated the EGAD. For a machine that the company practically bills as "budget," it's one impressive package.

Voodoo based the rig on CoolerMaster's "mainstream" ATC-710 case. The front bezel is aluminum, but the rest is just run-of-the-mill steel. Aluminum is lighter but more costly, and requires more tender loving care, so the steel infrastructure helps put the EGAD in Voodoo's "budget" line. On the outside of the case, Voodoo applied a beautiful, glassy-smooth, Tifosi red paint job and also did a number on the keyboard, mouse, satellite speakers, and monitor (no other competitor painted so many of its peripherals). A laser-cutout door and a pair of cold-cathode lights add extra pizzazz to the whole affair. While the paint on the Area-51 and Mach V were just as glossy and good as the EGAD, the EGAD's "total package impact" clearly dominates when all three rigs are viewed side by side.

Inside, there were no surprises, just a straight 2.8GHz P4, an Asus P4T533-C motherboard, and 1GB of PC1066 RDRAM. Ethernet chores are handled by an onboard controller, and audio is handled by a Creative Labs Audigy soundcard and Klipsch ProMedia 5.1 speakers.



Just chillin': The overclocked Radeon 9700 Pro is kept cool with the ThermalTake Chrome Orb and memory heatsinks.

A 20-inch viewable, aperture-grille monitor from NEC provides brilliant pixel output—not as splendid as Falcon's 24-incher, but very, very nice. We were actually hoping that one of the vendors would send an LCD panel (if only to give us fodder for negative criticism), but none fell into that trap. Voodoo also snagged an ATI Radeon 9700 Pro from its Canadian neighbors and adorned it with a ThermalTake Chrome Orb and memory heatsinks. The Orb cooler offers faster RPMs than the stock ATI cooling fan, but it also prohibits the use of the PCI slot next to the AGP card. That's a bummer, but perhaps it's best *not* to have that slot filled, considering the excessive temperature of its neighbor.

The last time these three PC vendors battled in *Maximum PC,* Voodoo went over the top, and its pricing ended up in fantasyland. This time, Voodoo relaxed its ambition-level just a tad. You still get the fastest videocard and CPU in town, but optical duties are handled by a single Plextor PlexComb drive that writes at 20x, rewrites at 10x, and reads DVD-ROMs at 12x. And instead of the 120GB Western Digital drives that seem to grow on trees, Voodoo opted for a RAID 0 config based on a pair of 80GB WDs with 8MB buffers. Both the Falcon and Alienware ace the Voodoo in terms of storage capacity, but Voodoo says it configured its box as a pure gaming rig, and believes few gamers ever need half a terabyte of storage.

The EGAD pushes its Radeon 9700 Pro from stock core/memory speeds of 325/310 to 330/325. We think the Radeon 9700 Pro can be overclocked even more, but then again, we don't have to eat the warranties for the videocards that fail! In terms of performance, the EGAD held up well, just edging the competition in *3DMark2001 SE* and clocking the fastest frame rates in our custom *Quake III Arena* test and *Jedi Outcast* benchmark. It also tied the Alienware rig in *Unreal Tournament 2003,* a punishing next-gen benchmark. No surprise here: The two over-

Let's Judge Aesthetics

The editorial team plays with black magic:

JON: This is my favorite of the bunch. Sublime internal wiring, great paint across all peripherals, and an overall perfect balance of flair and sophistication.

WILL: I like what Voodoo did with the window, but ultimately I only really care about performance.

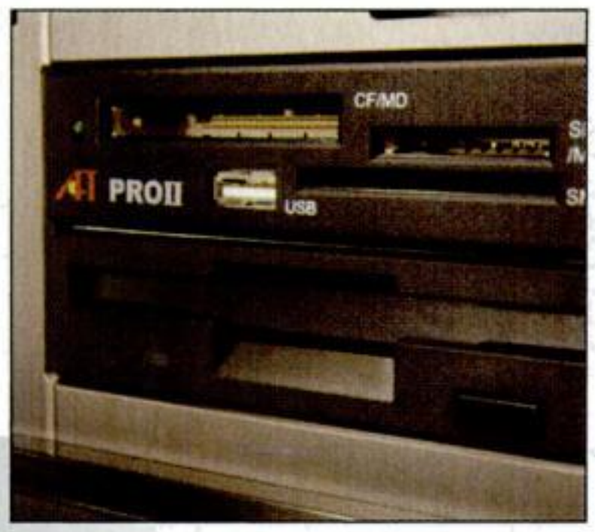
LOGAN: Man, that red is deep. The Voodoo doesn't need decals to express its inner kick-assing-ness.

GORDON: The case window is rad, and matching paint on the components round out the package, but it doesn't say "one of a kind" like the Falcon.

Copyrighted material

You light up my PC: Two lights placed on either side of the case window show off fancy interior stylings.

A bold move indeed, Mr. Voodoo: Do gamers really need anything more than a combo drive for optical chores? Voodoo thinks not.



Media chores: Right above the floppy drive sits an Atech Pro-II Media Reader, which has slots for USB, CF, MicroDrive, SM, MMC, and SD. Great news for digital gadget fiends.

clocked videocards in this competition had a slight advantage.

Voodoo is one of the first companies to push the envelope of gaming rig aesthetics; its world-famous wiring jobs are untouchable. Over the last few years, the company has also led the way in terms of gaming performance. With the EGAD, the company manages to provide *both* hardcore benefits—beauty matched by brawns—and for a price that falls in line with the competition.

BENCHMARKS	NOTES	VOODOO
CodeCreatures	Default Benchmark	3,074
3DMark 2001 SE	Overall Default	**15,570 marks**
3DMark 2001 SE Game 4 Nature	1280x1024	69.7 fps
Dungeon Siege	1600x1200	69.9 fps
Quake III Arena MPC Demo	1280x1024	**148.8 fps**
Jedi Outcast MPC Demo	1280x1024	**76.9 fps**
Comanche 4	1280x1024	53.99 fps
Unreal Tournament 2003 Inferno	1280x1024	**49.7 fps**

Red type denotes fastest score in competition.

UNDER THE HOOD

THE BRAINS	
CPU	2.8GHz Intel Pentium 4
Mobo	Asus P4T533-C
RAM	1GB PC1066 RDRAM
I/O ports	Seven USB 2.0, one FireWire, PS/2 mouse, PS/2 keyboard, parallel port, two serial ports, mic input, VGA, DVI, three analog out, digital audio in
LAN	Onboard Fast Ethernet
DISPLAY	
Videocard	ATI Radeon 9700 Pro (330 core, 325 memory)
Monitor	NEC FE2111SB
STORAGE	
Hard drives	Two 80GB Western Digital WD800JB in RAID 0 using a Promise FastTrack TX2
CD-RW	Plextor PlexComb 20/10/40-12A (20/10/40/12)
FINE DETAILS	
Case	CoolerMaster ATC-710
Fans/extras	Two 80mm fans, custom paint job, case window, Enermax 350 watt power supply, Atech Pro-II Media Reader
Mouse	Logitech MouseMan Dual Optical Mouse
Keyboard	Logitech Elite Keyboard
SOUND	
Soundcard	Sound Blaster Audigy Gamer
Speakers	Klipsch ProMedia 5.1
BUNDLE	

Windows XP Professional, *Easy CD Creator 5.0*, *CyberLink DVD*, Pioneer *RecordNow DX*, Sonic *My DVD 3.0*

BOOT: 68 sec. **DOWN: 8 sec.**

Copyrighted material

Our Scoring Cards

In the early days of PC gaming, it was easy to tell the difference between a run-of-the-mill OEM rig and a dedicated gaming system configured by a rebel vendor. Gaming PCs used to come with two sound-cards and three videocards (remember Voodoo2 dual-SLI?), and every PCI slot was packed with hardware. Today, multi-card solutions are obsolete, and just about any PC vendor can give you the best parts if you're willing to shell out the dough. Yes, the lines between, say, Voodoo and Dell have gotten blurrier, but they are still there. For example, the big OEMs would never sell you an overclocked videocard, pricing worries would steer them away from RAID, and they'd be hard-pressed to break from the standard beige box case design.

Taking the model of the "new gaming PC" into consideration, here's how the three competitors impressed us:

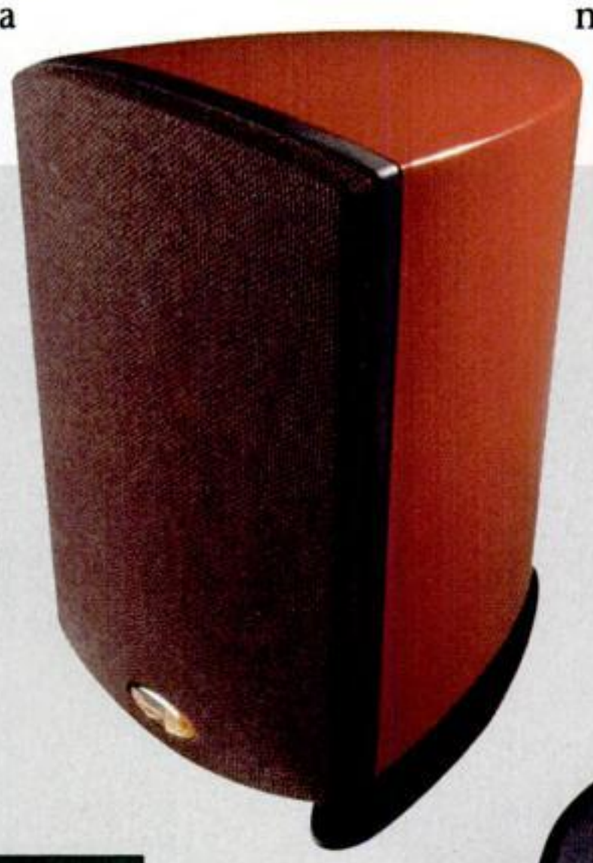
OUT OF THE BOX EXPERIENCE When you break open their boxes, all three vendors pamper you with extras. Each machine came with a hard-surface mousepad and branded T-shirt, and we were especially impressed with the leather-bound owner's manual that Voodoo now provides. Similar to the manual you get with a high-end automobile, it zips open and shut, and holds all your documentation and discs in a single package.

APPEARANCE Falcon gets special props for its hand-painted detailing. With its airbrushed rivets and bullet holes, it's the most intensive paint job we've ever seen on a PC. Special kudos also go to Voodoo for its laser-cut window and paint application on almost every bundled peripheral. We think the Voodoo is the best overall package, but the Falcon's case is the most outrageous. Alienware—which first pioneered the idea of painting an entire PC's load-out—kicked it up a notch with a lustrous paint job that matches the others in basic quality, but the overall Alienware package just doesn't compete.

PERFORMANCE No single system ran away with a benchmarking lead. This showdown was more like a NASCAR race, where different cars swap the lead for 100 laps, then shoot toward the checkered flag, three-abreast. For our tests, we actually ran far more benchmarks than we could list in our benchmarking charts on the three previous spreads. The ones we did list, however, are representative of the benchmarks that matter, and as you

WHICH SYSTEM WOULD YOU BUY?

OK, readers, here's your chance to prove us wrong: Send an e-mail to input@maximumpc.com telling us which gaming system you'd buy, and precisely why. You'll be judging the prices, configurations, and performance exactly as published in this article. Your comments will appear in a future issue. Thanks!

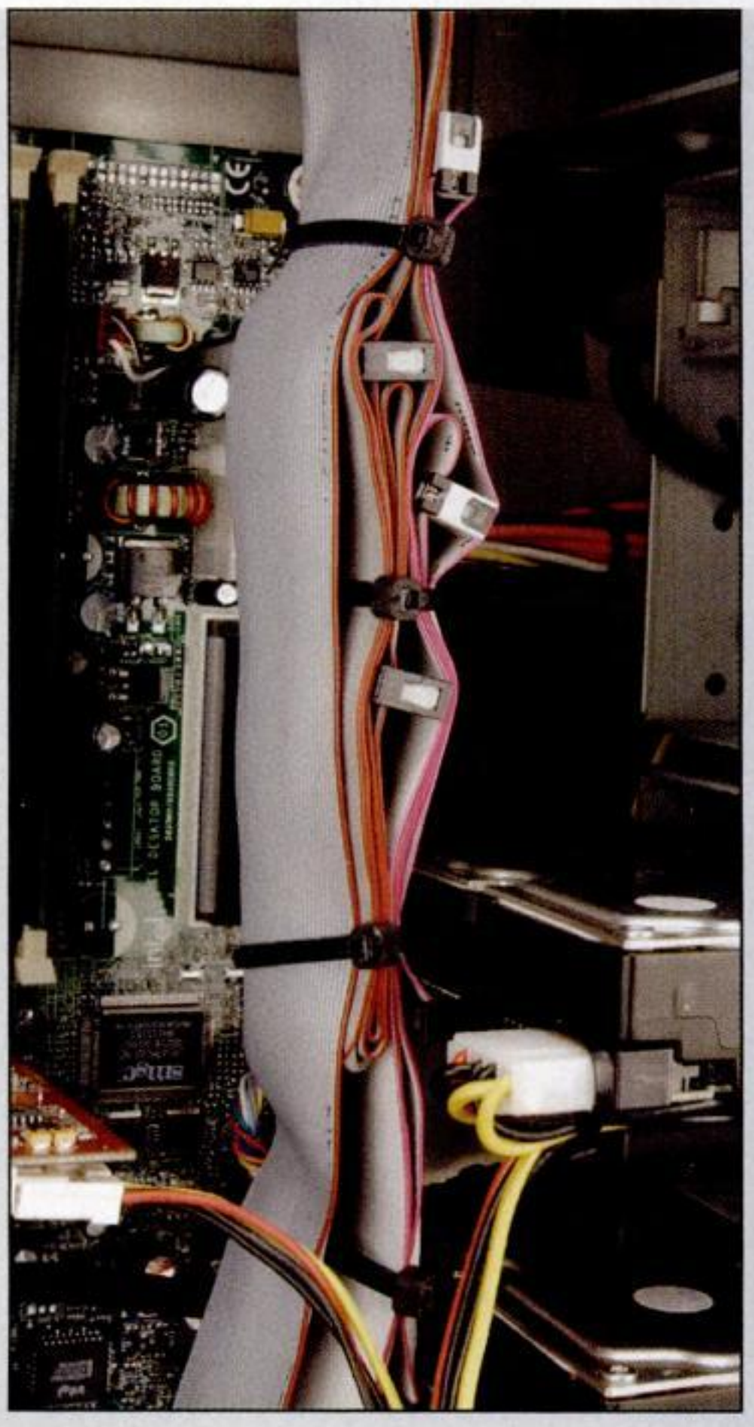


Redrum: Voodoo PC's Klipsch speakers are painted Tifosi red just like the case and monitor.

Bombs away! Hand-painted rivets and "nose art" by Pittsburgh artist Don Henderson make the Mach V Exotix truly custom.

Gamers like it hard: Many gamers prefer hard-surface mousepads for the responsiveness.

Tower of power: Alienware says it ditched its neatly folded IDE cables for this arrangement after customers complained that the old wiring was too hard to untangle.



Copyrighted material

Tech Support, Warranties, and Upgrade Programs

Falcon Northwest

This industry stalwart offers lifetime toll-free support, and all calls are handled by in-house technicians. Unfortunately, support is only available Monday through Saturday from 9 A.M. to 6 P.M. Pacific time. On the bright side, if your problem can't be fixed over the phone, Falcon will pay to overnight your system to and from its repair center, if you live in the United States. Note that this perk applies only to Falcon's Mach V model, and lasts the duration of the one-year warranty period. Dissatisfied customers can return their Falcon purchase within 30 days for a full refund—though special-order components may be subject to an unspecified restocking fee. Future upgrades can be purchased from Falcon, but customers receive no discount, and must foot the bill for shipping.

Alienware

Having recently spent millions on a brand-new in-house call center, Alienware now offers 24/7 toll-free tech support. The company also maintains an extensive online library of drivers, patches, and more, but we found some parts of it to be outdated or nonfunctional. The stock warranty lasts one year, but two- and three-year warranties can be had for more dough. If necessary, Alienware will pay to ship a system both to and from its repair depot (North American customers only). However, while Alienware offers a 30-day money-back guarantee, a 15 percent restocking fee is applied to all returns. As a special ownership benefit, customers can purchase future upgrades from Alienware at cost.

Voodoo

Voodoo's president boasts that he "can't even remember the last time a customer returned a system." Regardless, in case this supposed winning streak comes to an end, the company offers a 30-day, money-back guarantee. Every Voodoo system includes lifetime toll-free phone support handled by in-house technicians. Support is only available Monday through Friday, 9 A.M. to 6 P.M., and Saturday, 10 A.M. to 5 P.M. Mountain time. The EGAD-class systems get a one-year warranty, but you can upgrade to three years for more money. If repairs are needed, the company will pay to ship your system to and from its service facility, provided you live in North America. But forget tech support—the real story here is the upgrade policy. Owners of certain Voodoo systems (including the EGAD reviewed in this roundup) can purchase upgrades at wholesale pricing. Better yet, for a maximum cost of just one hour of labor, Voodoo will install the upgrades, re-cable the entire system, update the drivers and firmware, reinstall the OS, and create a new recovery CD—and even cover shipping.

can see, no single PC outscored the others by more than a few percentage points. The performance competition is thus a wash (except for the Alienware's snag in *Jedi Outcast*.)

PRICING Let's not mince words—these babies are expensive, and they might be overkill for anyone but readers of *Maximum PC*. When you get into the highest pricing categories for any consumer product, you begin spending 10, 20, or 30 percent more money for just 2, 5, or 10 percent more quality and performance. But that's the premium that true enthusiasts are willing to pay.

In this roundup, Falcon Northwest would put the biggest hurt on your wallet, to the tune of $7,790. That's quite an investment, but a good chunk of the price tag can be attributed to the insane paint job, quad-drive RAID array, and 24-inch display, which costs about twice as much as the other monitors featured here.

Voodoo's rig rang in at $5,000, while Alienware gave us a nice sigh of relief at $4,600. The Voodoo is practically a steal when you factor in the exchange rate between the U.S. and Canadian dollars, and consider the price at which Voodoo PCs normally run. As for Alienware, it's definitely the best bang for the buck. The rig can pump out competitive frame rates and the monitor is sweet—and that's what gaming is mostly all about.

And the winner is...

The Falcon is plumb crazy. Its load-out is decadent, but the videocard isn't overclocked, and the $7,790 price is just a bit hard to justify considering the comparable performance and features of its two competitors. Still, there's no denying that the Mach V is fast, and Falcon is the company to go to for the best custom painting and decaling in the business.

At $5,000, the Voodoo EGAD is actually inexpensive for a Voodoo system! It has performance in spades, and comes with 1GB of memory and a color-correct paint job across all its peripherals. However, the Voodoo lacks separate optical drives and comes with a smallish hard drive capacity, and this puts it behind the Alienware, a less expensive system.

The Alienware hits the sweet spot. You may not get the presentation of the Voodoo, but you get a DVD-R burner and larger drives—all for $400 less than the Voodoo.

But this is where the judges make a controversial decision and the whole arena erupts into bedlam: We're deducting a point from the Alienware rig because it was unable to run *Jedi Outcast*. We tried every trick possible to get the benchmark and game to run, but to no avail. Alienware execs say a duplicate of the box runs fine at their own headquarters, and we're inclined to believe them, but we just can't award the Area-51 first place. After all, this showdown is about the "essential consumer experience," and if any one of us spent $4,600 on a PC just to discover that it couldn't run one of the world's most popular games, we'd be upset indeed.

Sorry, Alienware fans. We know this is like a boxing match where the likely winner loses on a technical. But let this decision serve as a testament to the closeness of the competition. All three competitors offer nearly identical performance, so when choosing between the three, you really need to assign value according to your personal preferences.

As for *Maximum PC*, we declare Voodoo PC's EGAD the winner. It offers outstanding performance, confident fit and finish, and the best overall aesthetics in the competition. ■

VISIONARY/CONSULTANT

Makes the presentations
Develops new prospects
Stays a step ahead
Returns the calls
Makes quality time for family

DIRECTOR OF COMMUNICATIONS

Prints color and B/W documents
Copies all documents or bound reports
Faxes are received on plain paper
Scans in color at the touch of a button
Makes you look good

MFC-5100c
COLOR FLATBED MFC
About $299

Our Multi-Function Center® Models Do Everything. Just Like You.

No matter where or how you work, our all in one MFC's are designed to work for people like you. And with over 10 PC or Mac compatible models to choose from, finding the one with the performance and price you're looking for is easy.

Some even have the ability to print from your digital camera media card! If you need a multifunction solution that works almost as hard as you do, you don't need five separate machines, all you need is the right one.

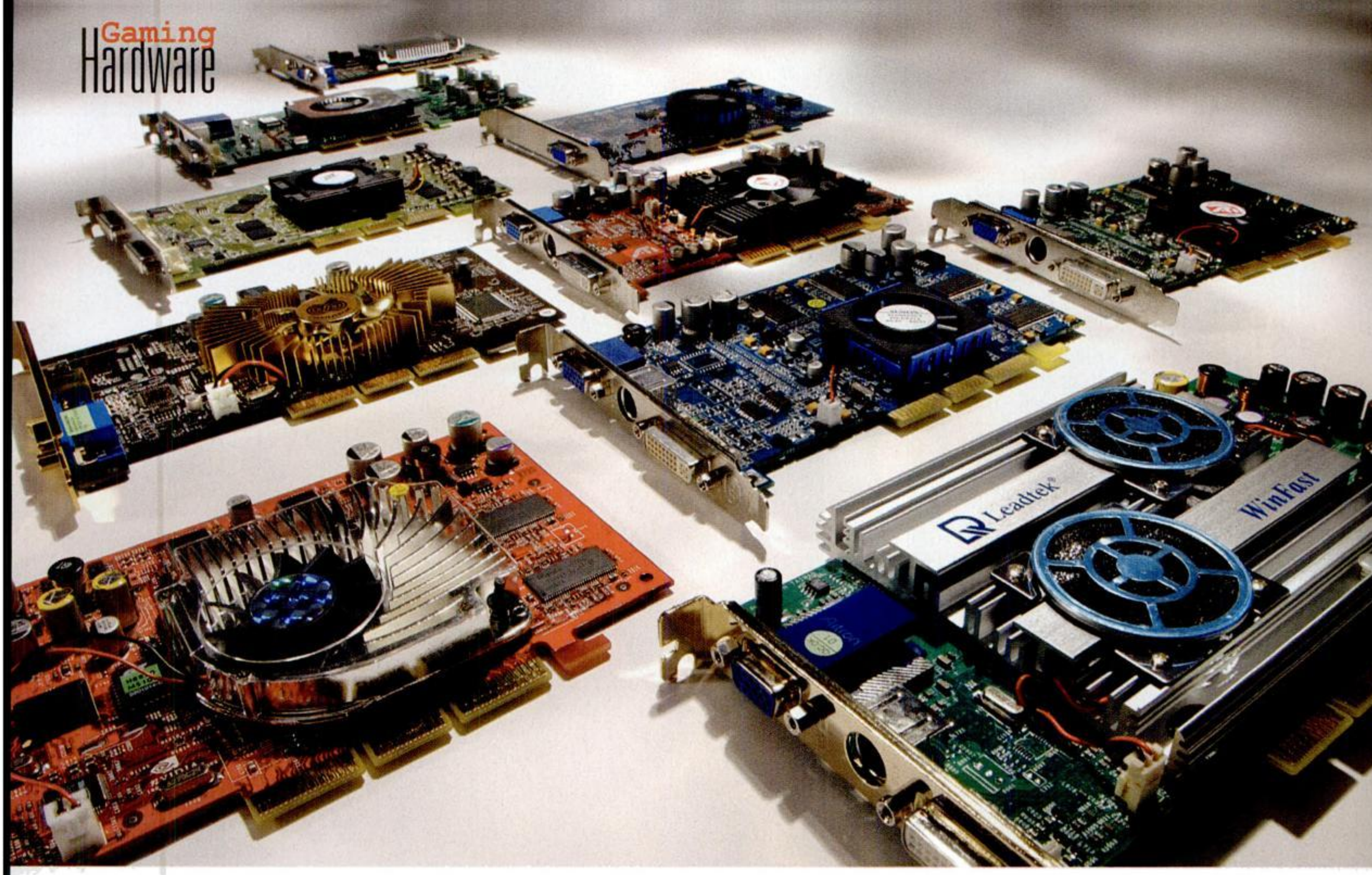
A VARIETY OF MODELS AVAILABLE AT: **Office Depot, OfficeMax, Staples, J&R ComputerWorld, Global Computer Supplies, CompUSA, MicroCenter, Fry's, PC Connection, MicroWarehouse, CDW, Insight, PC Mall, Quill, Viking, Dell, Amazon.com and Gateway.com**

At your side.™

brother®

© 2002 Brother International Corporation, Bridgewater, NJ · Brother International Corporation, Nagoya, Japan
For more information please call the Brother Fax-Back System at 800-521-2846 or visit our web site at www.brother.com

Copyrighted material



3D Card Grudge Match

We benchmark the bejesus out of every relevant 3D chip. The fastest--and slowest--revealed!

One sunny afternoon in August, the *Maximum PC* crew was lounging around the Lab talking shop, when Jon said, "You know what? A lot of our readers don't care about chip architectures, rendering techniques, and theoretical bandwidth numbers—they just want to know which videocard offers the fastest 3D acceleration, end of story, once and for all."

And thus the 3D card grudge match was conceived.

If you want to know which videocard is most appropriate for regular-old desktop work, stop reading here. This story is all about 3D gaming—which videocards offer the fastest frame rates for the money. We snagged 10 cards representing every major chipset available at press time, and ran 14 grueling game-based benchmarks on the lot of 'em.

Want to know which card has the speediest pixel shaders? We will tell you. Want to know which card will let you run anti-aliasing during heated online deathmatches? We will tell you. Want to know which card is the best you can buy for less than $200? We will tell you. And we'll also give you all the benchmark data you need to win an argument with that annoying know-it-all down the street. If you don't see your card represented on the chart, simply look for a card with the same chipset—barring overclocking, all cards based on the same reference design should perform essentially the same.

Copyrighted material

Real-World Benchmarks

We ran all our benchmarks like a typical user would: We installed the cards, installed the drivers, then tested away. The only driver control panel setting we changed was the AA setting. Otherwise, we went with each card's default panel settings.

All benchmarks were run in our standard test bed, which is based on a 2GHz P4, 512MB of RDRAM, and an Intel D850MV mobo. After each card's benchmarking run was complete, we installed a clean image of WinXP and started the process again with a new card. Here's the poop on each individual benchmark:

QUAKE3: We run our custom Quake3 demo on top of Version 1.29G of *Quake3* at 1280x1024/32-bit color. All visual quality settings are maxed and vsync is disabled.

JEDI OUTCAST: We run our custom *Jedi Outcast* demo at 1280x1024/32-bit color. All settings, including anisotropic filtering, are cranked to the max.

3DMARK2001 SE OVERALL: We use default settings. Please note that this is the only test in the bunch that spits out a cumulative points score, and not a frame rate.

3DMARK2001 SE GAME2 AND GAME4: We run these individual *3DMark* benchmarks at 1280x1024/32-bit color with compressed textures, double buffering, and the Z-buffer set to 24/32 bits.

DUNGEON SIEGE: To run Dungeon Siege, we open the system_detail.gas file in the game directory using Notepad, and delete everything between the two brackets in the [video_capabilities] section. Then we create a shortcut to the game executable and add the following command line options: fullscreen=true demo=true map=benchmark_demo teleport=island fpslog=true minfps=0 height=1200 width=1600 bpp=32 vsync=false shadowrendertarget=TRUE

UNREAL TOURNAMENT 2003: We use build 928 and the inferno benchmark at 1280x1024/32-bit color with all settings maxed in-game.

SPECIFICATIONS

NAME AND URL	CHIPSET	MEMORY	CORE	PRICE
PRICE IS NO OBJECT				
ATI Radeon 9700 PRO www.ati.com	R300	128MB/310MHz	325MHz	$375
Matrox Parhelia www.matrox.com	Parhelia	128MB/275MHz	220MHz	$320
Leadtek WinFast A250 Ultra TD www.leadtek.com	GeForce4 Ti 4600	128MB/325MHz	300MHz	$300
Visiontek Xtasy GeForce4 Ti 4400 www.visiontek.com	GeForce4 Ti 4400	128MB/277MHz	274MHz	$250
LESS THAN $200				
MSI G4Ti4200-VTD64 www.msicomputer.com	GeForce4 Ti 4200	64MB/257MHz	250MHz	$150
ATI Radeon 9000 Pro www.ati.com	R200	64MB/275MHz	274MHz	$135
Tyan Tachyon G9000 Pro www.tyan.com	R200	64MB/275MHz	274MHz	$135
LESS THAN $100				
Chaintech A-G440 www.chaintechusa.com	GeForce4 MX 440	64MB/202MHz	270MHz	$90
Aopen GF4MX-420-V64 www.aopen.com	GeForce4 MX 420	64MB/167MHz	250MHz	$65
Hercules 3D Prophet 4500 64MB, www.hercules.com	Kyro 2	64MB SDR/ 175MHz	175MHz	$50

Copyrighted material

3DMark Overall is reported as a total score. All other scores report an average of frames per second.

BENCHMARKS

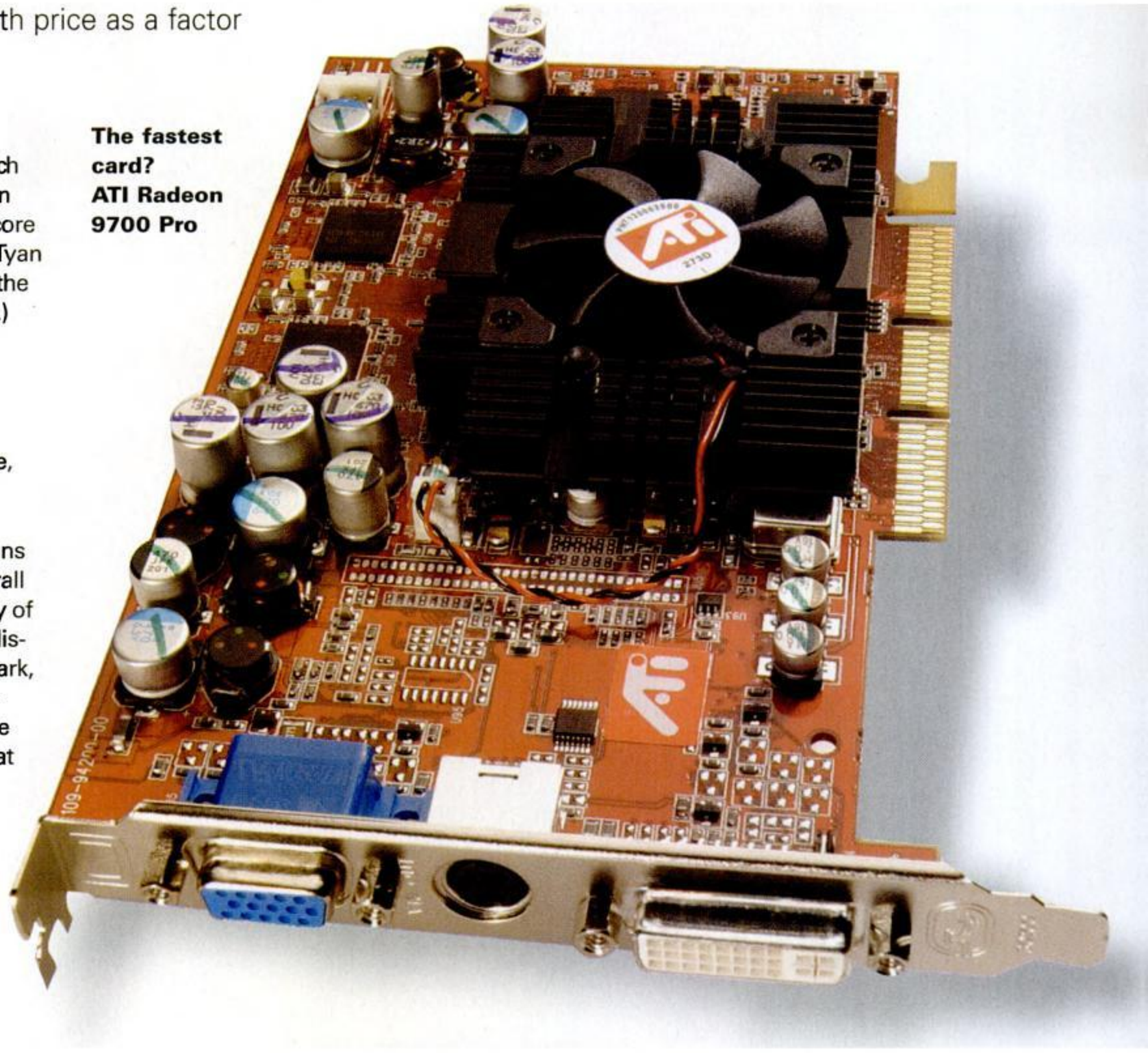
QUAKE3 MPC DEMO		JEDI OUTCAST MPC DEMO		3DMARK OVERALL		3DMARK GAME 2		3DMARK GAME 4		DUNGEON SIEGE		UT 2003	
No AA	2xAA	No AA	2xAA	No AA	2xAA	No AA	2xAA	No AA	2xAA	No AA	2xAA	No AA	2xAA
102.9	**103.1**	**49.8**	48.8	**11987**	**10985**	**114.1**	**96.9**	**66.6**	**51.3**	**58.3**	**57.4**	**43.0**	**38.9**
79.3	57.7	40.9	35.8	7431	5685	54.9	37.0	21.2	15.3	36.6	33.2	25.0	20.0
105.0	96.5	49.5	**49.8**	10182	8660	89.6	64.3	32.8	23.2	44.6	30.1	29.7	24.0
100.3	83.2	49.4	49.0	9842	8023	83.0	57.7	29.3	20.4	42.4	27.7	27.2	21.3
103.1	**83.6**	**49.7**	**49.4**	**9465**	**7460**	**76.1**	**49.7**	**26.7**	**16.6**	**41.6**	27.6	**16.7**	5.7
87.2	33.9	49.1	30.9	7495	4838	51.7	24.8	26.0	11.8	36.5	**36.6**	14.8	**11.9**
86.1	33.2	49.0	30.4	7403	4661	45.9	23.2	25.2	11.2	36.4	35.7	14.8	11.8
86.2	**49.2**	**47.8**	**34.7**	**5715**	**3568**	**37.6**	**22.4**	DNR	DNR	**33.0**	18.4	**14.5**	**5.9**
49.4	23.3	40.5	21.8	4108	2118	23.8	11.3	DNR	DNR	20.1	9.7	9.7	5.2
46.1	46.0	33.7	33.3	3093	1676	19.4	20.6	DNR	DNR	21.1	**21.0**	DNR	DNR

1) Red bolded scores represent fastest performance in each of the three individual pricing categories. 2) Our reported prices are averages of the three lowest prices found on Pricewatch.com. 3) nVidia boards were run with the 30.82 Detonator drivers. The ATI Radeon 9000 Pro and Tyan Tachyon G9000 Pro were run with Catalyst 02.2 drivers. The Radeon 9700 Pro was tested with the WHQL drivers from the CD that shipped with the board. The Parhelia was tested with the 1.00.04.231 driver, except in the case of *UT2003*, which was tested with a beta 1.01 driver. The Prophet 4500 was tested with driver version 15.084.

Copyrighted material

Performance Is in the Pocketbook of the Beholder

Let's choose some winners—with price as a factor



The fastest card? ATI Radeon 9700 Pro

We realize that not everyone is ready to spend $400 on a videocard, so here's an analysis of frame rate performance in each pricing category. (All of the cards tested in this article run manufacturer-suggested core and memory frequencies. We added the Tyan Tachyon to the mix to see if it could beat the ATI Radeon 9000 Pro on which it's based.)

Best that money can buy

If you care about speed, and speed alone, the ATI Radeon 9700 Pro is your baby. At $400, it's certainly not cheap, but it absolutely dominated our benchmark runs in every way that mattered. With an overall *3DMark* score that's a mere 13 points shy of 12,000, ATI's new videocard was the undisputed winner of this composite benchmark, which reports a cumulative score of performance in nine tests (eight of which are based on actual game engines). Note that the GeForce4 Ti 4600 scored a measly 10,182 in the same test bed.

Unreal Tournament 2003 represents the next generation of first-person multiplayer shooters. With massive polygon counts, huge textures, and constant action, the inferno demo scores of 43fps and 39fps (with 2x anti-aliasing off and on, respectively) prove that the 9700 is ready for whatever's coming. Also, the Radeon 9700 spanked the competition in the *3DMark* Game 4 programmable shader test. This benchmark, which requires DirectX 8–compatible hardware, reveals a card's ability to render the next generation of visual effects, and as you can see, the 9700 scores were double the nearest competition with or without AA enabled.

Best for less than $200

The sub-$200 class is unbelievably crowded these days. For a long time, the reigning el-cheapo card was the GeForce2 MX from nVidia. But with new cards based on ATI silicon creeping in for less than $200, the budget card market has become a lot more interesting (see page 12 for the big picture).

After a careful analysis of the benchmarks, and upon finding some surprisingly low price quotes on Pricewatch.com, we concluded that the MSI G4Ti4200-VTD64 gives you the best bang for your buck. With a core architecture based on the same silicon used by GeForce4 Ti 4600 cards, the VTD64 smokes through most benchmarks. But the operative word here is "most."

While the MSI board showed entirely respectable scores in *Dungeon Siege, Jedi Outcast,* and *Quake 3,* it suffered in benchmarks that fill the card's meager 64MB of onboard memory—for example, *Unreal Tournament 2003* with anti-aliasing enabled. While the 64MB ATI Radeon 9000 Pro cards didn't suffer the same drop-offs with AA enabled, they were still too slow overall to compete with the Ti 4200 in the budget category. The upshot is that the G4Ti4200-VTD64 might be a nice card to use until *DOOM III* arrives (at which point, most everyone will need to upgrade again!).

Best for less than $100

Awarding a winner in the sub-$100 category is like picking your favorite Korean-made luxury sedan. There just ain't much to choose from. So instead of picking on one of the stinkers that we tested, we're going to recommend that you hold off on your purchase, save another $30 or $40, then spring for either a Radeon 9000 Pro– or GeForce4 Ti 4200–based card. The Ti 4200s offer more performance than the 9000 Pros, but both chip families include support for programmable shaders, and will let you play most of the games we benchmarked at 1024x768 without incident. It also seems that ATI has finally written some solid drivers. We had absolutely no problems running any of our benchmarks on either of the 9000 Pro-based boards.

As for the Kyro II and GeForce 4 MX-based cards, just say no. Besides lacking shader support, their raw performance numbers are a joke. We recommend that you save your money and move up to a more expensive pricing category. Your games will thank you. ■

Copyrighted material

24-bit Clarity — 500-Watt Power

Sound BLASTER AUDIGY™

MAXIMUM PC KICK ASS PRODUCT

CAMBRIDGE SOUNDWORKS MEGAWORKS 510D

3D soundSurge Surge Of Approval "GOLD"

Sound Blaster® Audigy™ is the highest quality Dolby Digital® 5.1 sound card capable of delivering 24-bit/96kHz audio clarity, EAX® ADVANCED HD™ audio realism, and SB1394™ PC-to-PC connectivity for high-speed data transfer. And the only PC speaker system powerful enough to support Sound Blaster® Audigy™'s 24-bit/96kHz audio output, through a proprietary digital S/PDIF, is the Cambridge SoundWorks® MegaWorks™ 510D. Featuring 500 Watts of thunderous power, Cambridge SoundWorks® MegaWorks™ 510D boasts the most consistent frequency range available in a PC speaker system. So if you're looking to add the highest quality audio with maximum power to your PC, make sure you include these award-winning products. Ask for them at your local computer retail store, or visit us at **www.americas.creative.com**.

CREATIVE®

©2002 Creative Technology Ltd. The Creative logo is a registered trademark of Creative Technology Ltd. in the United States and/or other countries. All brands or product names listed are trademarks or registered trademarks and are property of their respective holders.

Copyrighted material

Next-Gen Game Engines

BY WILL SMITH

If you've ever played the game *Aliens vs. Predator 2*, *Soldier of Fortune*, or *Freedom Force*, then you've played a game that uses a third-party engine.* Creating the raw rendering code for a 3D game is both expensive and time-consuming, so the vast majority of the world's game development studios simply purchase the rights to someone else's engine, then use that engine to drive their own original content. After all, why reinvent the wheel if John Carmack has already figured out the best way to render dot-product bump-mapping? Why not pay a couple-hundred thou for old Johnny's finest code, then focus your efforts on the actual 3D modeling, artwork, and story lines for your game?

Currently, there are dozens of game engines available for license. First, you've got your big-name engines such as Quake III and Unreal. These babies power the industry's Triple-A titles. Then you've got your second-tier engines developed by no-name programmers—very nice work, oftentimes, but rarely celebrated outside of hardcore gaming circles. Then you've got the original Quake and Quake II engines, which are now available for "free" under the GPL license. Anyone with technical chops can use these old-school engines to develop a game for fun and profit.

So what do you get when you shell out a quarter of a million dollars for a top-of-the-line game engine? Generally, you get all the back-end mojo that makes a game work—the 3D renderer, the sound engine, the networking code. You also get AI and physics code, plus all the content-creation tools that are required to design levels and models, and just plain make the game work.

Ultimately, a game engine is just a starting point. Regardless of which engine a game studio uses, a living, breathing human still has to plug in content that's fun, exciting, and eye-catching. And therein lies a nagging little problem: All too frequently, different games based on the same engine look vaguely similar. Hopefully, this problem will be at least partially fixed by the four next-generation game engines featured in this article. The upcoming DOOM, NetImmerse, LithTech, and Unreal engines can all hook into the programmable shader units found in today's most advanced videocards. The practical upshot is that by the end of

*Lest we forget, *Aliens vs. Predator 2* uses LithTech's current engine, *Soldier of Fortune II* is based on the Quake III engine, and *Freedom Force* employs the current engine from NetImmerse.

Copyrighted material

Want to put that superpowerful videocard to use? Amazing opportunities await just around the corner. We give you four game engines that'll reinvent 3D graphics and make you glad you bought that GeForce4 or Radeon 9700...

Braaains! **The hellspawn in *DOOM III* represent the absolute pinnacle of PC game realism. Each character is completely bump-mapped and capable of casting shadows upon itself (note the shadowing around the lead zombie's collar and neckline). Too bad this screenshot isn't anti-aliased.**

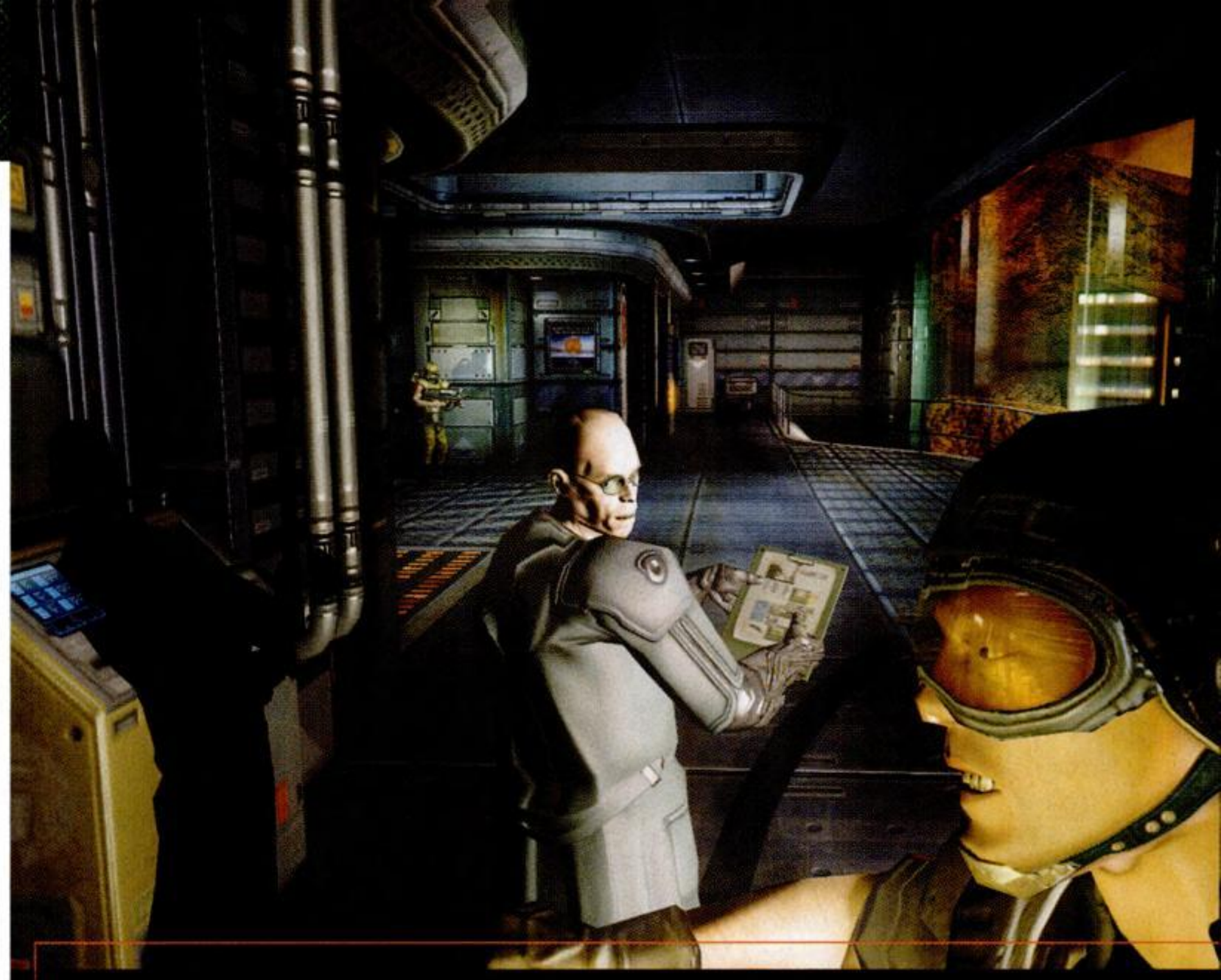
Copyrighted material

2003, we should see a lot of games with awe-inspiring programmable shader effects. Procedural textures and volumetric grass will be commonplace, and suddenly any game based on the "archaic" Quake III engine will look laughably simple.

Presenting... The DOOM Engine

DOOM III is undeniably the most anticipated title of 2003, but we don't care about the gameplay—we just want to know about the engine!

At the last E3 trade show, we saw a live glimpse of *DOOM III* and its underlying DOOM engine, and what we experienced made our legs tremble. The screenshots in this article (along with the ones floating around online) just don't do justice to the game's revolutionary lighting model. The demo we experienced lasted just about 10 minutes, but it proved that id has used programmable shader technology to create scenes with movie-like detail (all during actual gameplay; we're not talking about pre-rendered cutscenes). The demo's climax involved a Marine making his way down a corridor. As he moved, his shadow progressively shrunk on the wall in front of him. We gasped with horror when he approached the wall and his shadow was suddenly obscured by the much more massive shadow of an unimaginable beast sneaking up behind him!



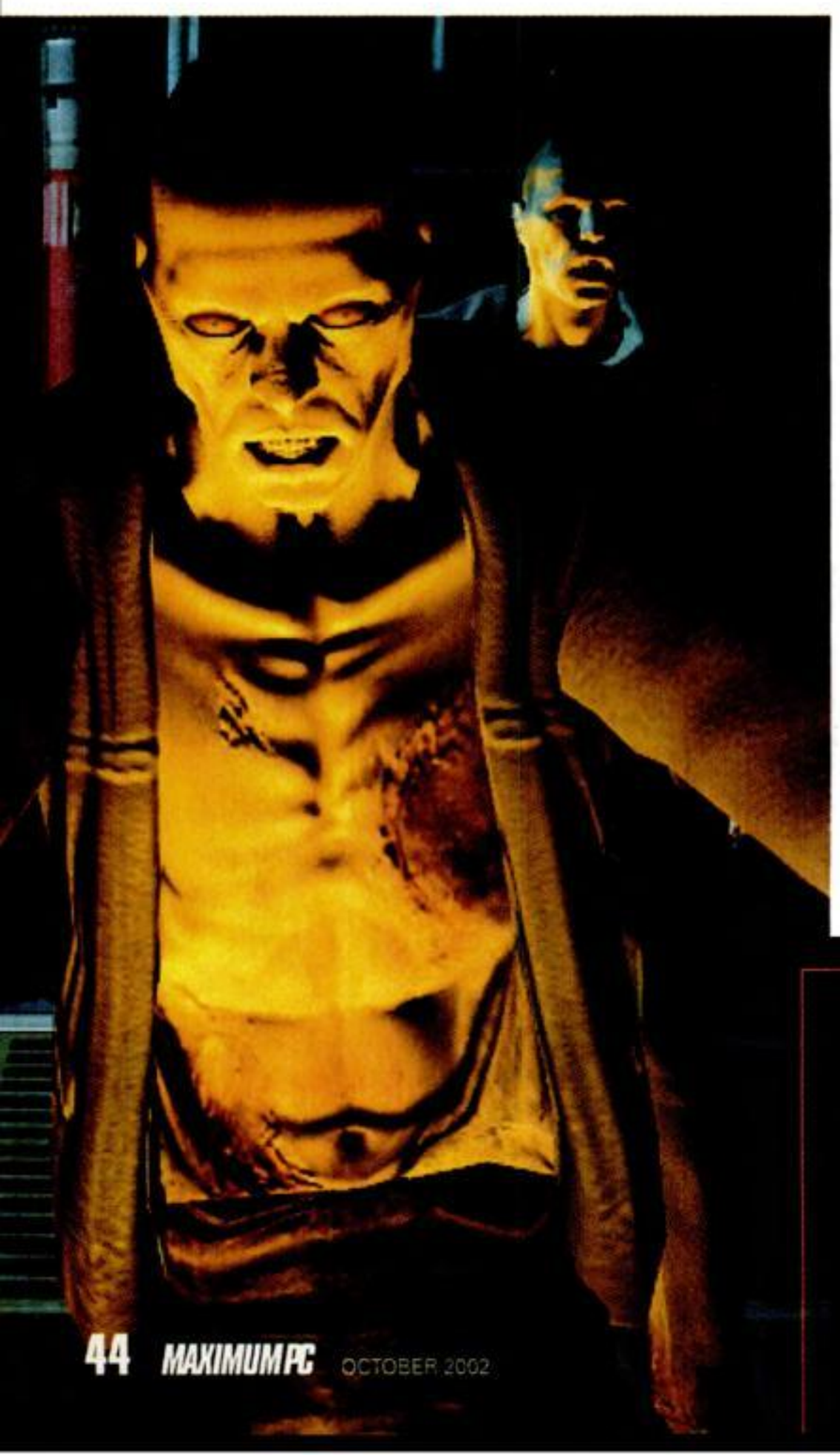
Check out the realtime shadows cast by this delightful bald chap, and the reflections in the Marine's goggles. And let's not overlook the reflective bay windows. All of these fine DOOM details add up to an overall effect of pervasive realism.

The new DOOM engine's lighting system is arguably the most significant improvement to the first-person shooter genre. Unlike most engines, the DOOM engine employs a *realtime* lighting model. This means that instead of using static light maps (which, by their very nature, are incapable of reacting to the movement of different objects), DOOM generates all its lighting effects on the fly. The upshot is that light sources can be turned on and off and even moved around a game environment. (Imagine an overhead lamp swinging back and forth.) This just wasn't possible in any previous Quake engine game.

Shadows go hand-in-hand with lighting effects. In virtually every 3D game ever created, shadows are "cheated." Usually, they're just static textures that are swapped in and out as appropriate—they're not created from the true occlusion of a light source. The DOOM engine, however, can create realistic shadows by using "stencil shadow volumes," which are created on the fly when a light source reacts with an occluding object. The results are realistic shadows that can project onto any surface—including other dynamic models that are casting their own shadows. Additionally, as you can see in the screenshot to the left, a model such as a zombie can also cast a shadow onto itself. The combination of real-world lighting and realistic, dynamic shadows will combine to make *DOOM III* the most immersive PC game ever.

But wait: There are still more graphical goodies to be ogled. The DOOM engine allows bump maps to be applied to nearly every surface in a game. This gives everything from floor tiling to a zombie's pockmarked chest an irregular, realistic-looking surface. Each character in *DOOM III*—from the Marines to the assorted hellspawn—started as an extremely detailed model with about one million polygons. Those models were then converted to much lower polycount models with detailed bump maps that add scars, armor seams, and wrinkles in clothing. The good news is that any game based on the DOOM engine should be able to match this level of detail.

The magic made possible by the DOOM engine is near infinite. For instance, take a look at the large screenshot at the top of this page. See the reflections on the soldier's goggles and in the large window? See the gleam on his teeth? Realtime reflections and specular highlights like these will



These zombie-fied gents are especially pleased with themselves. Note that their shadows are casting back upon themselves, something previously unheard of in realtime 3D games. Now imagine just how cool this looks when all the shadows are changing realistically in motion! *DOOM III*—we can't wait!

Copyrighted material

Spells punishing: 26,875

Tournaments underway: 882

Creatures attacking: 49,438

Prizes on the line: 5,000

Deadly strategies: Unlimited

MAGIC The Gathering®
ONLINE

DEADLIEST STRATEGIES

MOST COMPETITION

BEST REWARDS

In seconds, ***Magic: The Gathering®*** *Online* lets you access over a thousand powerful creatures and spells. All different. All deadly. And every year, hundreds more are added to the arsenal.

Magic® *Online*:
Second to none.

Get the game free: mtgonline.com

All trademarks are property of Wizards of the Coast, Inc. ©2002 Wizards

Copyrighted material

be de rigueur for any game that licenses Carmack's latest creation.

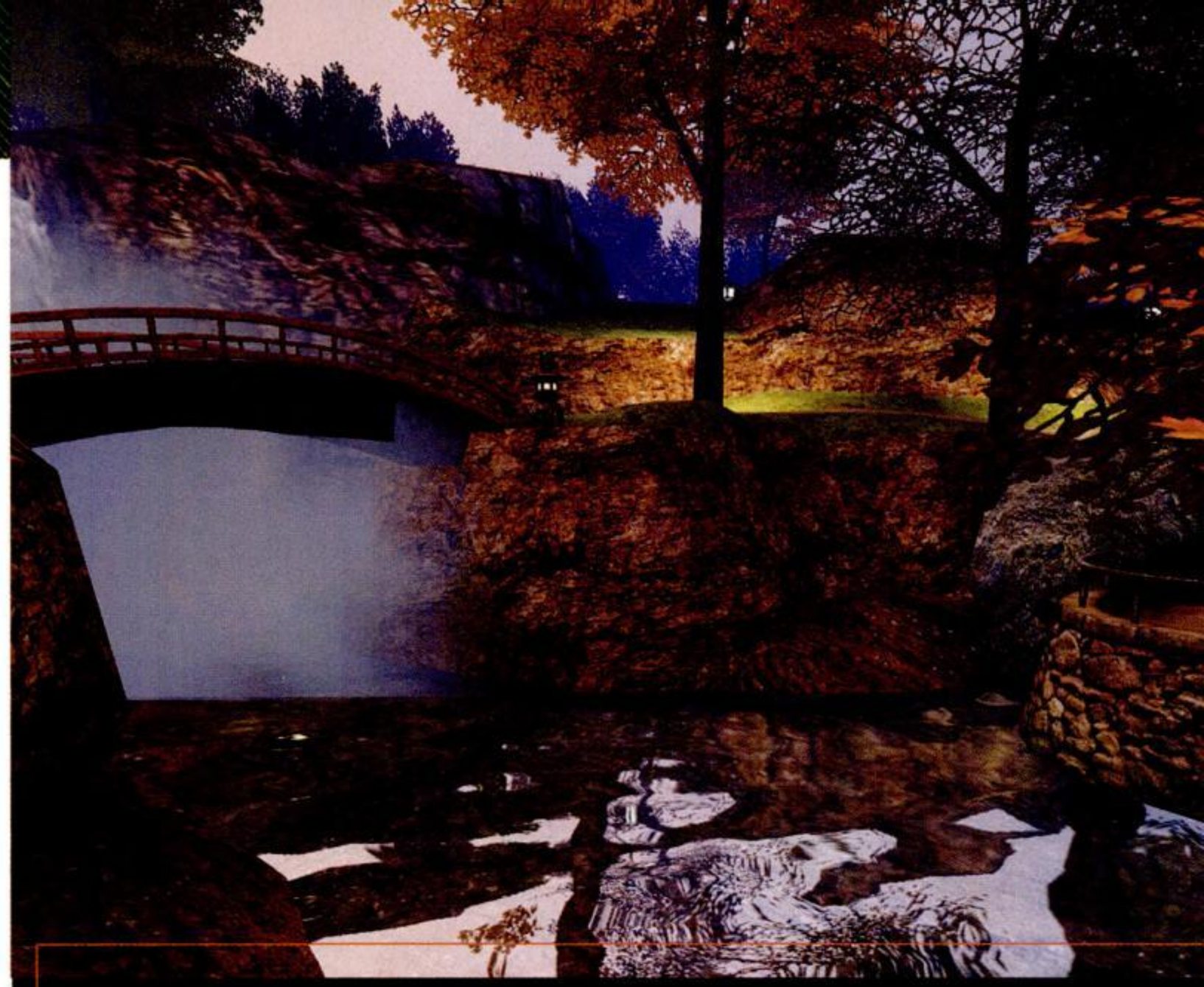
Expect to see the new DOOM engine to first appear in *DOOM III* sometime in 2003. No other developers have announced that they'll be licensing the engine as of press time, but we expect that there's a line of drooling game studio executives forming in Mesquite, Texas right now, anxious for a chance to throw down.

LithTech Lives Forever

In 1996, the developers at Monolith were working on two games at the same time, *Shogo: Mobile Armor Division* and *Blood 2*. *Shogo* was a fast-paced giant-robot game with an anime theme, while *Blood 2* was a straight-up first-person shooter. Instead of creating two separate engines for the seemingly different games, Monolith instead developed one engine that worked for both titles. Thus was born the LithTech engine.

Monolith's engine has spawned dozens of titles in the past six years, ranging from first-person shooters, to realtime strategy games, to driving games. A future version of LithTech technology—code-named Triton—is even powering the programmable shader glow effects in the hotly anticipated *Tron 2.0* game.

But this article is primarily concerned with the Jupiter version of the LithTech engine, which will power *No One Lives Forever 2*, the sequel to the campy spy classic. The Jupiter renderer is brand-new, and about 30 times faster than the version of LithTech that powered *Aliens vs. Predator 2* in 2001. You can expect to see more polygons per scene and more detailed textures in *NOLF2* than in any other LithTech game to date.



The LithTech Jupiter engine—debuting in *No One Lives Forever 2*—can draw some fantastic water and much higher detail scenes than was possible in previous versions of the engine. The water's rippling effect can realistically react to any object that falls in the drink.

In *NOLF2*, the extra power will be used in a new particle system specifically designed to render weather effects. In the original *NOLF*, the graphics engine was able to draw only about 1,000 particles at any given time. Because of this limitation, the engine could draw particles only in proximity to the player (instead of throughout the entire map), and the effect just wasn't convincing. The Jupiter engine, meanwhile, will be capable of drawing 50,000 weather particles. This makes for much more believable snowstorms.

The Jupiter engine is also capable of stunning water effects (just check out the screenshot above). Believe it or not, the engine's water reflections don't depend on programmable shaders; all they need is a T&L-enabled card, such as an original GeForce or original Radeon. Even more impressive is the fact that Jupiter's "cube environment mapped" water will generate realistic ripples and waves if something—or someone—disturbs its surface.

The LithTech engine also comes with unique goal-based AI. Instead of relying on simple scripting to generate enemy responses, baddies are assigned goals and personalities. These personalities can range from "the gung-ho guard" (who just wants to shoot someone, *anyone*, and runs into all situations with guns a-blazing) to "the career henchman with a wife and two kids" (who runs for the alarm panel because he just wants to get home safely at the end of the day).

NOLF2 and *Tron 2.0* are in the first wave of a LithTech-powered gaming bonanza. There are currently dozens of LithTech-based games in development. Despite its surge in popularity, Monolith's goal remains the same: to create an engine and toolset that will allow game developers to focus their energies not on authoring rendering code, but on making games as fun as possible.

In *Tron 2.0*, your battle against the MCP will be powered by the LithTech Triton engine. As you can tell, this red glowing fellow represents pure evil—pure evil fueled by a programmable shader, mind you!

NetImmerse Yourself in Gaming

A relative newcomer to the gaming scene, the NetImmerse engine made a big impact last year with some popular titles. But the programmers at Numerical Design Ltd (NDL) aren't dwelling on the success of *Morrowind*, *Freedom Force*, *Dark Age of Camelot*, and *StarTrek: Bridge Commander*.

Copyrighted material

Record. Edit. Mix. *Create.*

Desktop audio is more than just ripping MP3s.

cool edit

Take the next step.

Download your copy today from www.cooledit.com.

Oh, and Cool Edit rips MP3s too, if you're into that.

Syntrillium Software

P.O. Box 62255 | Phoenix, AZ 85082 USA | 1.888.941.7100 | tel: +1.480.941.4327 | fax: +1.480.941.8170 | sales@syntrillium.com | www.syntrillium.com

toll-free sales, USA and Canada

Copyrighted material

In this NetImmerse demo, we see the effect of a sheep cloning experiment gone horribly awry. Your next first-person shooter probably won't feature 37 sheep in a single scene, but it may feature 37 enemies on a map, and that would give games a much-needed sense of density and chaos that they currently lack.

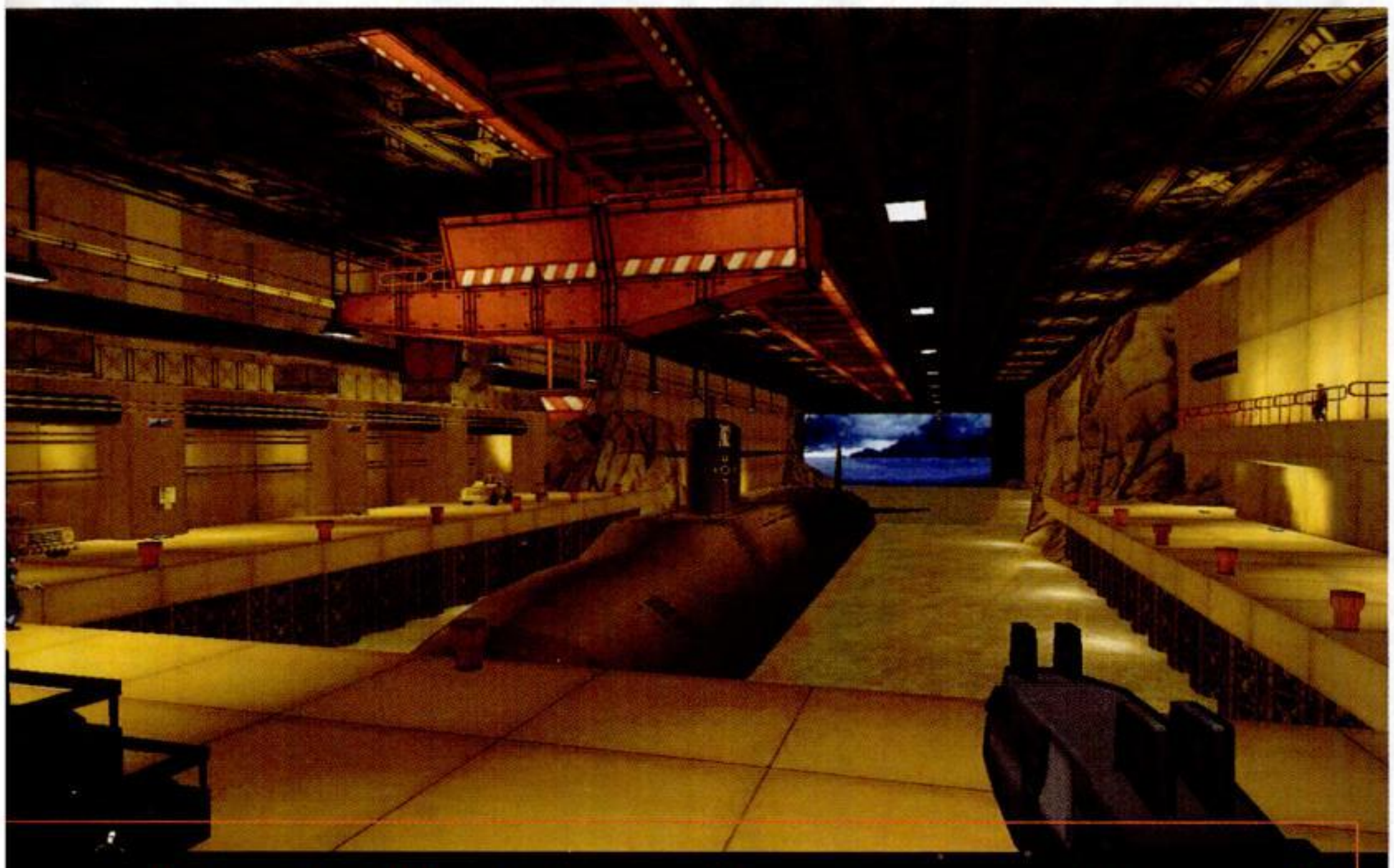
Instead, they're continuing to make better and more powerful tools. Like Monolith, NDL develops ever-evolving game engine technology. To date, the NetImmerse engine has been used for mass-market games intended for low- and mid-powered video-cards, but there's no reason why the technology can't be implemented in much more breathtaking ways. Lars Bishop, chief technology officer of NDL, explains:

"*Freedom Force* and *Dark Age of Camelot* look great, but they were on an earlier version of the engine. However, for our next version of NetImmerse, vertex and pixel shaders will be much easier to access in the artists' pipeline—so, the artists and the effects/shader programmers can work together much more smoothly. This is going to lead to more shaders and effects on all sorts of objects, not just the 'in your face, this is a shader' objects.

"People are also going to see a lot more high-quality characters in the scene at once. Games need to look more and more 'crowded,' more interesting. For urban scenes and big battles, that means lots of smooth-skinned, effects-laden characters. NetImmerse is always working to get every bit of performance out of the target platforms, and character performance is an area where you can never have too much—so we're focusing on it for this release."

To see what NetImmerse is capable of right now, take a look at *Morrowind*. This game doesn't include support for programmable shaders, but still looks fantastic. The NetImmerse engine also has a positional sound engine that's capable of mimicking room acoustics, sound localization, and echoes. Sounds can be attached to any object in a scene, from a collapsing building in *Freedom Force* to a Klingon Bird of Prey in *Bridge Commander*. The most recent version of NetImmerse also includes the Havok real-world physics engine. Havok provides all the algorithms a developer needs to describe how an object should behave when it's shot, what happens when it collides with another object, and even how fast it free-falls, something that's deceptively complex.

NetImmerse-based games have run the gamut of genres—from racing, to fishing, to MMORPG—and we expect to see more good things from the engine in the future.



In the cell-shaded Unreal engine game *XIII*, you play as a commando in a pen-and-ink world. We've seen cell-shaded, comic book–style games before, but never any that looked this good!

Unreal--Yet Somehow Very Realistic

Powering everything from first-person shooters to 3D pinball sims, Epic MegaGame's original Unreal engine is perhaps the most prolific engine in game development history. But just like Carmack's Quake III engine, it's undergoing a complete reinvention for a new generation of visually stunning graphics.

Epic is tight-lipped about its plans, but by our best estimation, we think the first iteration of the new engine will roll out in *Unreal Tournament 2003* sometime before the end of this year. Next up will be *Unreal 2*, which will be a bit more visually stunning than *UT 2003* because it's a single-player adventure and doesn't have the multiplayer game's frame rate requirements. Then,

Copyrighted material

finally, sometime in late 2003, we'll see another monumental advancement: the game that fansites are calling *Unreal Warfare*—the ultimate, shader-rich iteration of Epic's engine. We've got early-early screenshots of the ultimate Unreal technology, but not a lot of information. So let's focus on what we'll see this year.

Epic tells us that *UT 2003* will have *100 times* more polygons than the original *Unreal Tournament*. Combine that polycount with textures that are up to eight times larger, and you can expect to see obscenely complex maps that are absolutely cram-packed with detail. Outdoor environments in particular should look much more realistic, with smooth, rolling hills complete with trees and ground cover. This should be exponentially more impressive than the box canyons that were prevalent in the original *Unreal* and *Unreal Tournament*.

Different developers are doing different things with the liberal polygon budgets afforded by the new engine. In the "graphic novel"–inspired *XIII* (pictured to the lower-left and upper-right), the new Unreal engine generates some of the most realistic-looking cell shading we've ever seen. In addition to the normal ink outlines around the character models, *XIII* also simulates the ink that's used to shade comics and give them texture. The screenshots of *XIII* look incredible, but they really can't illustrate how awesome the game looks when in motion.

Surprisingly, in order to draw and animate all the polygons you'll see in the two most imminent Unreal-based games, you'll need just a reasonably modern 3D accelerator. *UT 2003* doesn't even require hardware T&L, but having it will give you proper frame rates and resolutions. *Unreal 2*, which is purported to have 10 to 20 times more polygons than *UT 2003*, does require hardware T&L, but not a card with programmable shader technology. So what's the motivation to upgrade to a more advanced programmable shader card?

Epic's 3D programming guru Tim Sweeney says, "Going from old DirectX 7 T&L cards to DirectX 8 cards like the GeForce4 Ti and Radeon 8500 brings another significant leap in performance and visuals. Seeing the big outdoor levels in *UT 2003* running at 1600x1200, 60fps is quite an experience."

We wish we had more info on Epic's ultimate engine code, but as Tim Sweeney told us, talking about it "would be like id Software talking about *DOOM 4*." That said, we do expect Epic's finest to feature more procedural textures—textures generated on the fly by the program, instead of in *Photoshop*—and *DOOM*-like bump maps on everything.

Absolutely splendid. ■

In *XIII*, you'll be confronted with a lot of interesting moral dilemmas, but we don't care about that. Check out the shading done on this guard's clothing and on your hand. It's the closest we've ever seen to the art found in a high-quality graphic novel.

This shot from an unannounced Unreal engine game shows the level of detail we can expect to see in 2003. Note the signature Unreal lens flare from the light just beyond the bridge, and the matrix of shadows cast all around the entrance of the cave.

Reprinted material

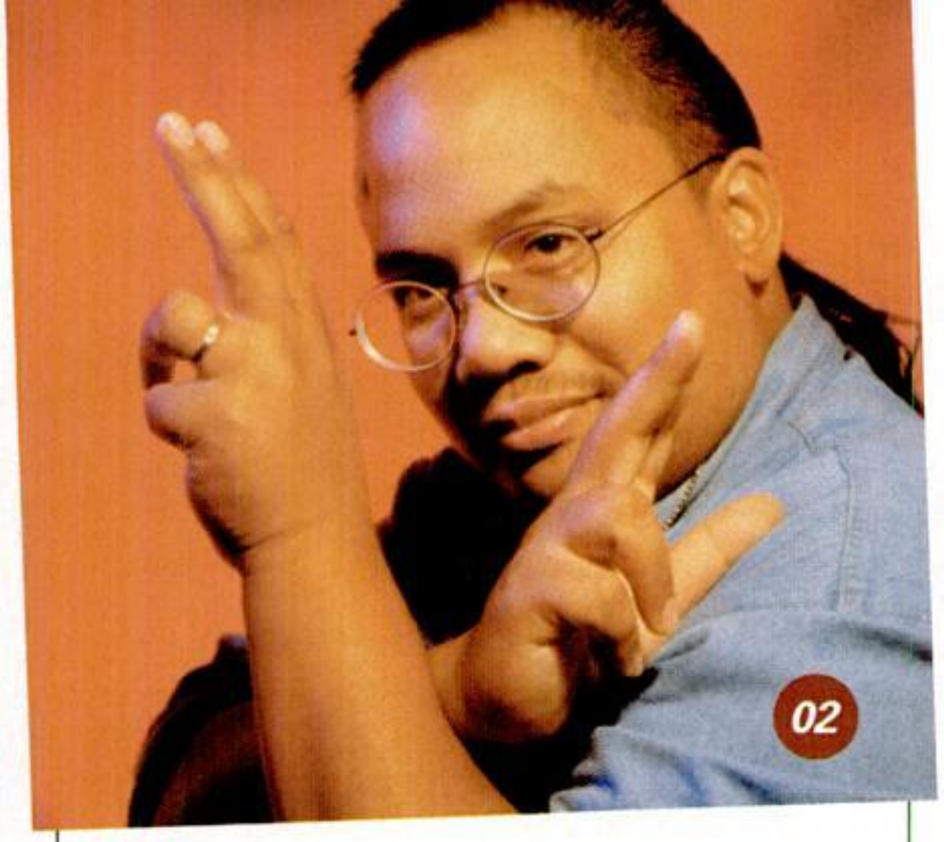
THE MAXIMUM PC 50

Join us as we commemorate our 50th issue with a look back at the magazine's 50 most significant articles and events. Most are glorious, a few are ignominious, and one or two are just patently bizarre. May the next 50 issues be as fun to publish as the first!

11/98_Birth of a Legend

Rising from the bubbling hardware bouillebase of *boot* magazine, *Maximum PC* hoisted itself upward. Our goal was to expose all of *boot's* hardcore edge to a mainstream audience that wanted Pure PC Power, but didn't know where to find it. A sticker on the front cover—"New: The Magazine That Killed *Home PC*"—summed up our attitude perfectly.

Copyrighted material



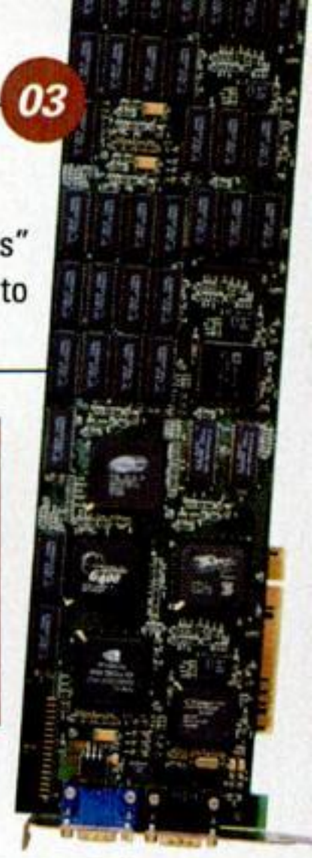
02/99_Kicking Ass Upstairs

Readers called Andrew Sanchez the voice and lifeblood of *boot* and *Maximum PC,* but those who knew him personally called him a friend, a complete original, and just a plain weird-ass dude. No one could ever morph, massage, and upturn a pop culture catch phrase like Andrew, and some of us can still hear him mocking John Romero by singing the word Daikatana to the melody of "My Sharona."

The Best Hardware that Never Was

03

Witness the ultimate ultimate 3D accelerator, the Bitchin'*fast!*3D[2000]. Despite integrating all five major 3D chipsets and scoring four times as many "BungholioMarks" compared with its nearest competitor, this speed demon, tragically, never made it to mass production.



Did We Really Say That?

04

"This drive is untouchable and a must for any power user." We said that about Kenwood's 40x CD-ROM with multi-beam True X technology. Well, as it turns out, it *was* touchable—by the courts. In due time, after numerous customer complaints, the Kenwood 40x would be investigated by the magazine's own Watchdog and become the subject of a successful class-action lawsuit.

05

04/99_This Moment in History, Part 1

Revolutionary technology takes balls. And that's exactly what Diamond Multimedia displayed when it debuted the Rio PMP300, the first MP3 player we ever reviewed. Even though MP3s were still largely an underground phenomenon (Napster would debut just a month later), the Rio's portable MP3 player anticipated the revolutionary effect MP3s would have on PCs and music lovers everywhere.

But First Would You Just Sign This Release Form?

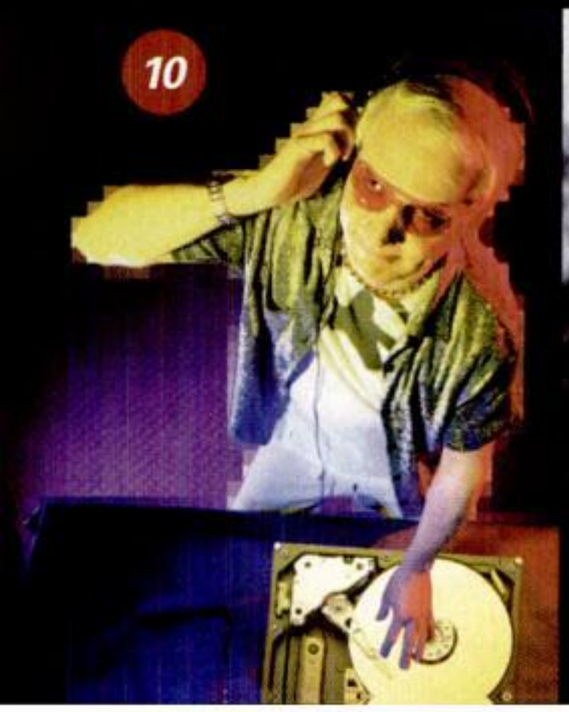
Here's our M.O.: We invite a bigwig from a major PC vendor to participate in an interview. We discuss technology issues over vodka tonics, and once the interviewee begin to slur his speech, a box gets knocked over, and out pops a superhero outfit, deer antlers, a ninja get-up—whatever. Then we say "Hey, let's get some pictures of you in this? It'll be a gas! Don't worry, the shots are just for us."

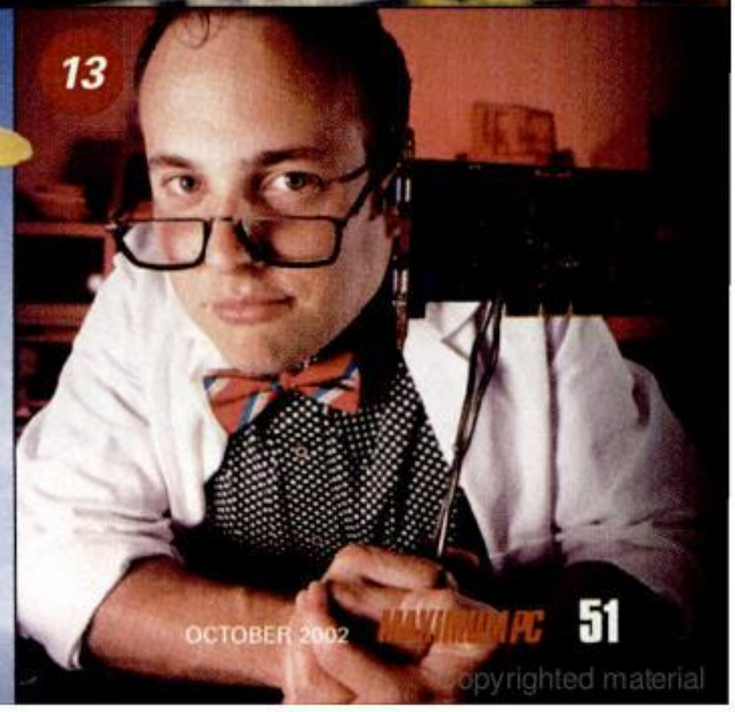
Punishing Review No. 1: Apple iMac

06

"Apple shot its wad designing this all-in-one modern-art piece while cutting corners on most of the important components… If the iMac is Apple's shape of things to come in personal computing, the future looks grim indeed." Didn't like it then (it received a 2 verdict), and we don't much like it now.

07_Neil Trevett, 3Dlabs; 08_Tom Furlong, Silicon Graphics; 09_Eric Engstrom, Microsoft; 10_Bob Scranton, IBM; 11_James Boer, Deer Hunter developer; 12_Ted Briscoe, Iomega; 13_Dan Wood, Matrox





Copyrighted material

05/00_This Moment in History, Part 2

14

In a spectacular move that must have left Intel seething, AMD was the first to dangle a 1GHz processor before our slobbering faces. Containing 22 million transistors on a 0.18-micron process, the benchmark-clobbering Athlon proved that clock speed was still king.

15

11/99_Coup d'Etat!

Well, it wasn't exactly a coup (former editor-in-chief Brad Dosland decided to pursue a career online), but when Phillips was promoted from second banana to top dog, he whipped up a revolutionary fervor that turned the magazine upside down. Many feelings were hurt, but the power-shift also ushered in our Rig of the Month, In the Lab, and Let's Humiliate Our Intern sections.

Punishing Review No. 2: Race Leader Force Feedback Racing Wheel

16

"In an ordinary world, the Race Leader's wheel design would already relegate it to the crap heap, but its muted implementation of force feedback makes it the King of Crap Mountain." Verdict? A generous 2.

The Microsoft "Freedom to Innovate" Award

17

While those kooky Mac folks oohed and aahed over the blazing-fast speed of the G4 Cube in a total of two *Photoshop* filters, we were equally impressed by the versatility of the machine's unique design. In this example, we found that the Cube pressed all the nutritious goodness out of our favorite vegetables, while leaving all the nasty pulp behind.

18

02/00_The Technology Heard 'round the World

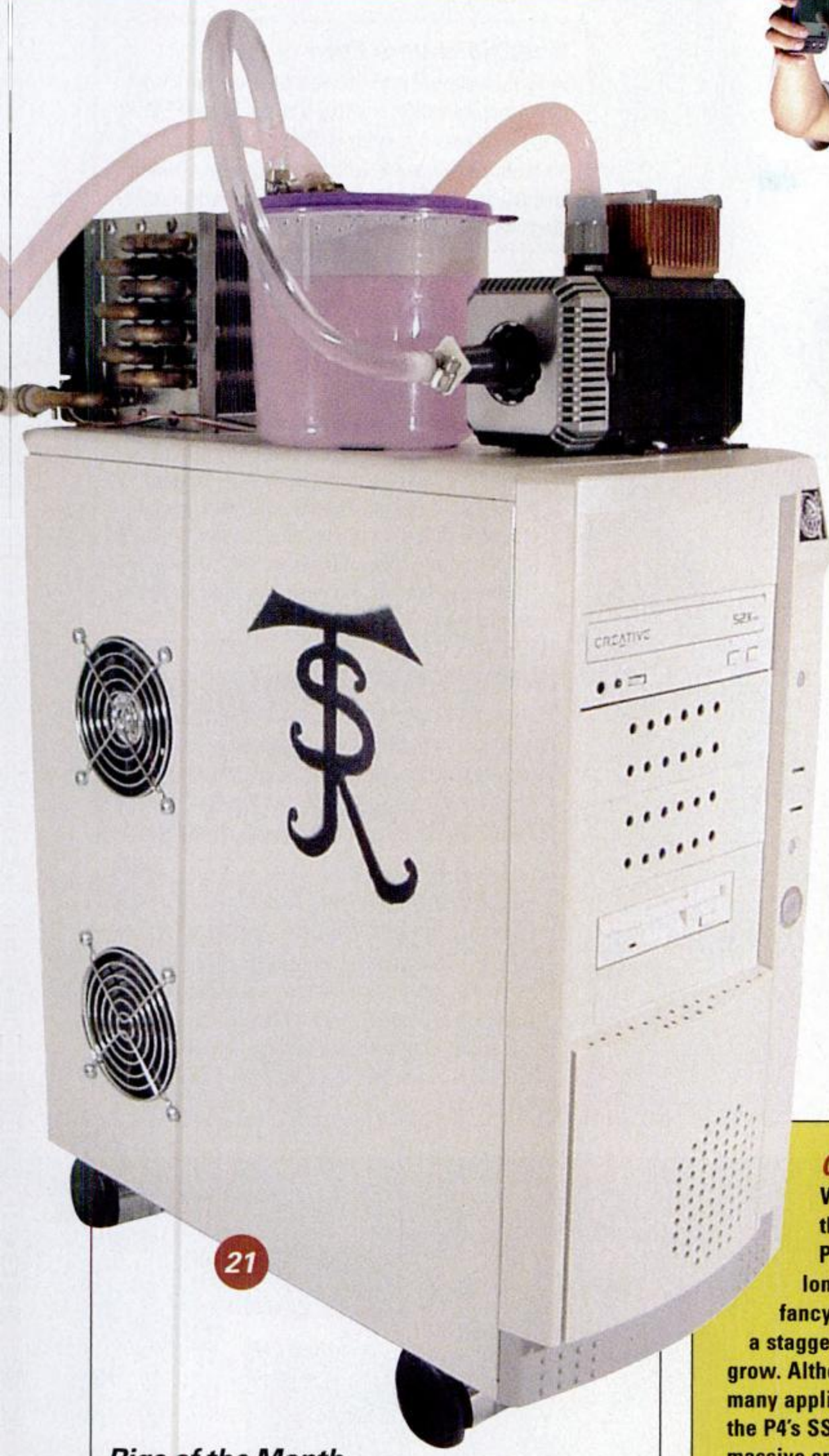
While music industry executives were sitting on cushions stuffed with cash and smoking fat stogies in the gentlemen's lounge, a revolution was taking place online. Napster's design encouraged users to explore the collections of file-sharers with similar tastes in music, and it could be argued that no other single technology got so many people interested in PCs. In February 2000, MP3 audio got its first cover story in *Maximum PC*.

19

02/00_They Came. They Saw. They Kicked Ass.

Having *Quake III* and *Unreal Tournament* arrive in the same month is an experience that can only be likened to being in the middle of a tornado when an 8.6 earthquake hits. They weren't just great games—they set a new standard for games of every genre, and put the word "deathmatch" into the dictionary. Well, our dictionary, at least.

Copyrighted material



21

Rigs of the Month

Anyone can buy a fast PC. Anyone can buy a PC with cool interior lights. But every month, we feature a one-of-a-kind PC built by one of our readers. These creations defy common sense, laugh in the face of mere window-cuts, and offer a little bit of insight into the minds of the truly visionary and/or deranged. Ryan Scavone's Gooey Chillinator is a perfect example of the ultimate in PC hot-rodding, and also taught us what a "water bong" is really meant for.

Punishing Review No. 3: Real Jukebox Pro

23

"It might be more aptly named *Real Pukebox*. It's buggy and confusing, and crashed all three systems it was tested on. At least it isn't secretly tracking our listening habits and uploading them to marketing goons—anymore." Ouch, another 2 verdict.

20

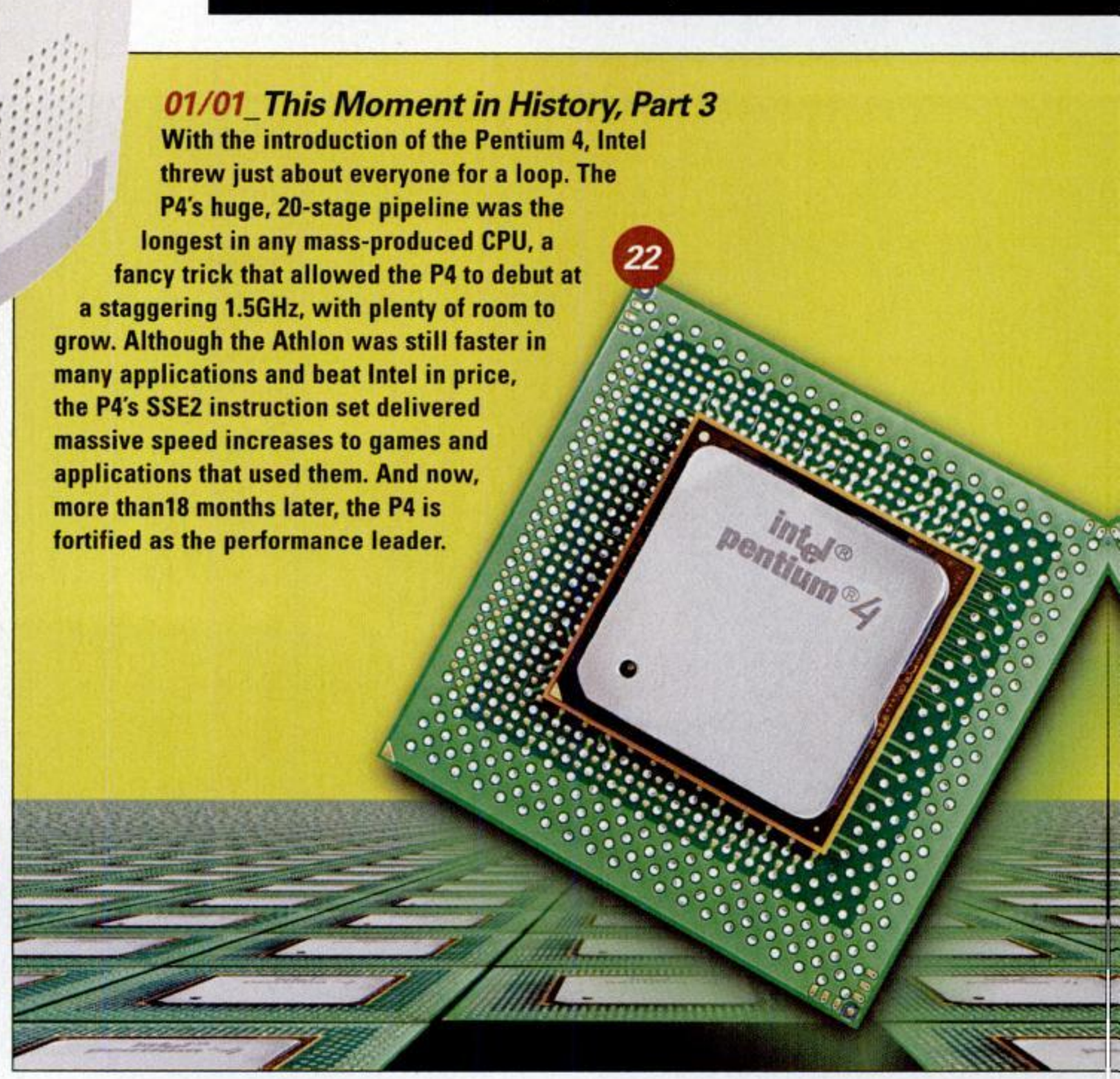
Gordon Mah Ung Through the Ages

Maximum PC **has changed a lot during the past four years, but amid all the clamor, there's been one constant: Gordon Mah Ung. So why in the world does our senior editor sport so many different looks?**

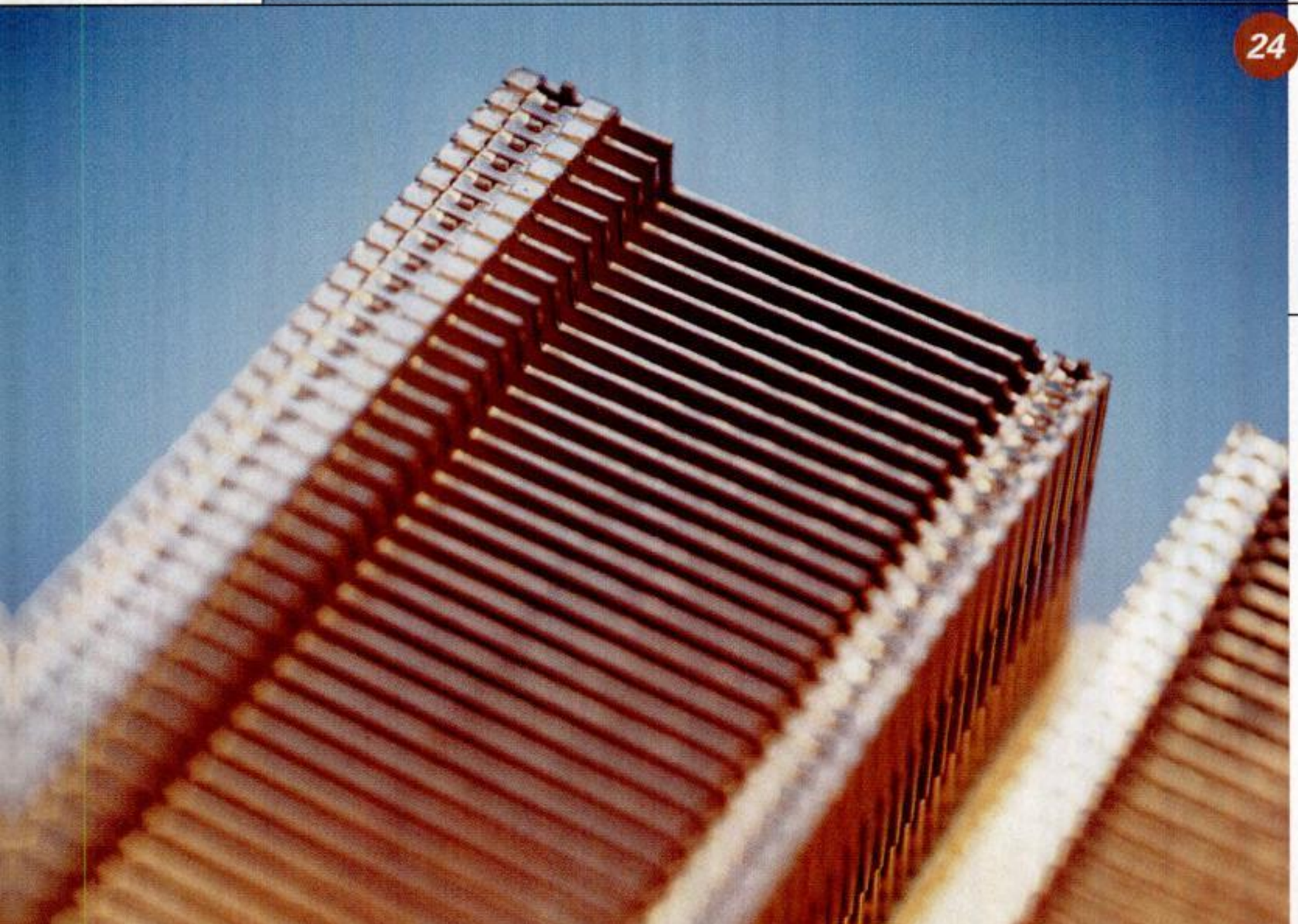
01/01_This Moment in History, Part 3

With the introduction of the Pentium 4, Intel threw just about everyone for a loop. The P4's huge, 20-stage pipeline was the longest in any mass-produced CPU, a fancy trick that allowed the P4 to debut at a staggering 1.5GHz, with plenty of room to grow. Although the Athlon was still faster in many applications and beat Intel in price, the P4's SSE2 instruction set delivered massive speed increases to games and applications that used them. And now, more than18 months later, the P4 is fortified as the performance leader.

22



Copyrighted material



24

Best Hardware Porn

In 1964, Justice Potter Stewart defined hardcore pornography thusly: "I know it when I see it." Well, wait till he gets a gander at ThermalRight's SK-6 pure copper heatsink, which we photographed in luscious, revealing detail. It begs to be admired, it beckons you to touch. Go ahead—lick it.

12/01_The Watchdog Takes a Bite

25

After fielding an alarming number of complaints about IBM's popular 75GXP hard drives, the Watchdog was using all four paws to get IBM to address the drive's problem. Big Blue denied that there were any production anomalies, but once reader Michael Granito spoke to the Dog and found out that many others were reporting similar drive snafus, he filed a class-action lawsuit against IBM, alleging a "uniform defect" in the design or manufacturing process.

26

Who Said What:

"Happy sims bother me, and totally messed-up sims are too hard to control, so my ideal sim is slightly screwed up but trying—like me."

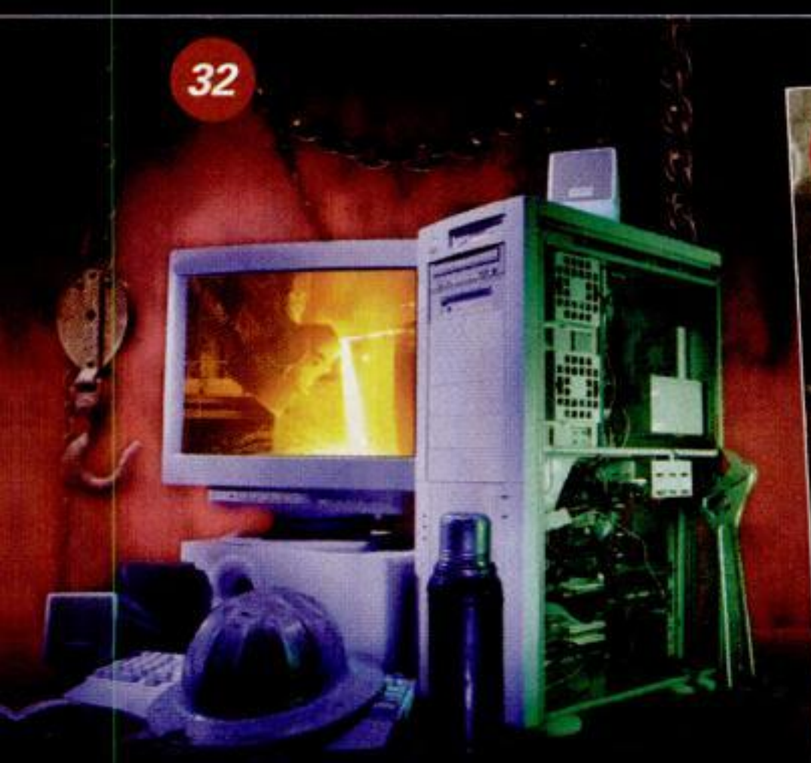
—T. Liam McDonald

27

Punishing Review No. 4: Ricoh MediaMaster Combo Drive

"The MediaMaster not only plays DVD-ROMs… it also produces dozens of coasters on which you can rest your favorite beverages! …A Ricoh engineer said the MediaMaster's inability to record CD-Rs is a 'known problem.'" Verdict: 2

The Dream Machines: We Did It Our Way



32

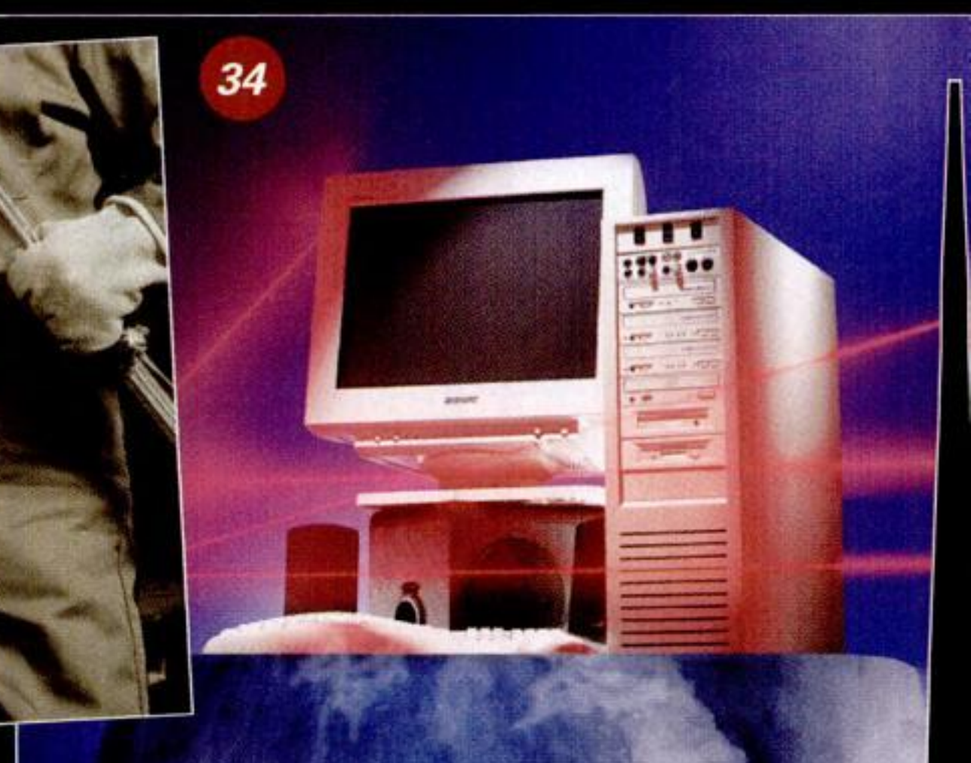
Dream Machine 1998

In the very first issue of *Maximum PC*, we hand-picked the 17 best components, abandoning all reason in pursuit of the ultimate PC, the baddest of the bad. At the time, that meant a P-II running at 400MHz with 128MB of memory, a Matrox Mystique G200 for 2D graphics, and a Canopus Pure 3D II for 3D acceleration.

33

Dream Machine 1999

The purpose of our second annual Dream Machine feature was to teach our readers how build PCs. Thus, it was a somewhat more sober affair: a 500MHz P-III, a Matrox Millenium G400 MAX, and just 128MB of RAM.



34

Dream Machine 2000

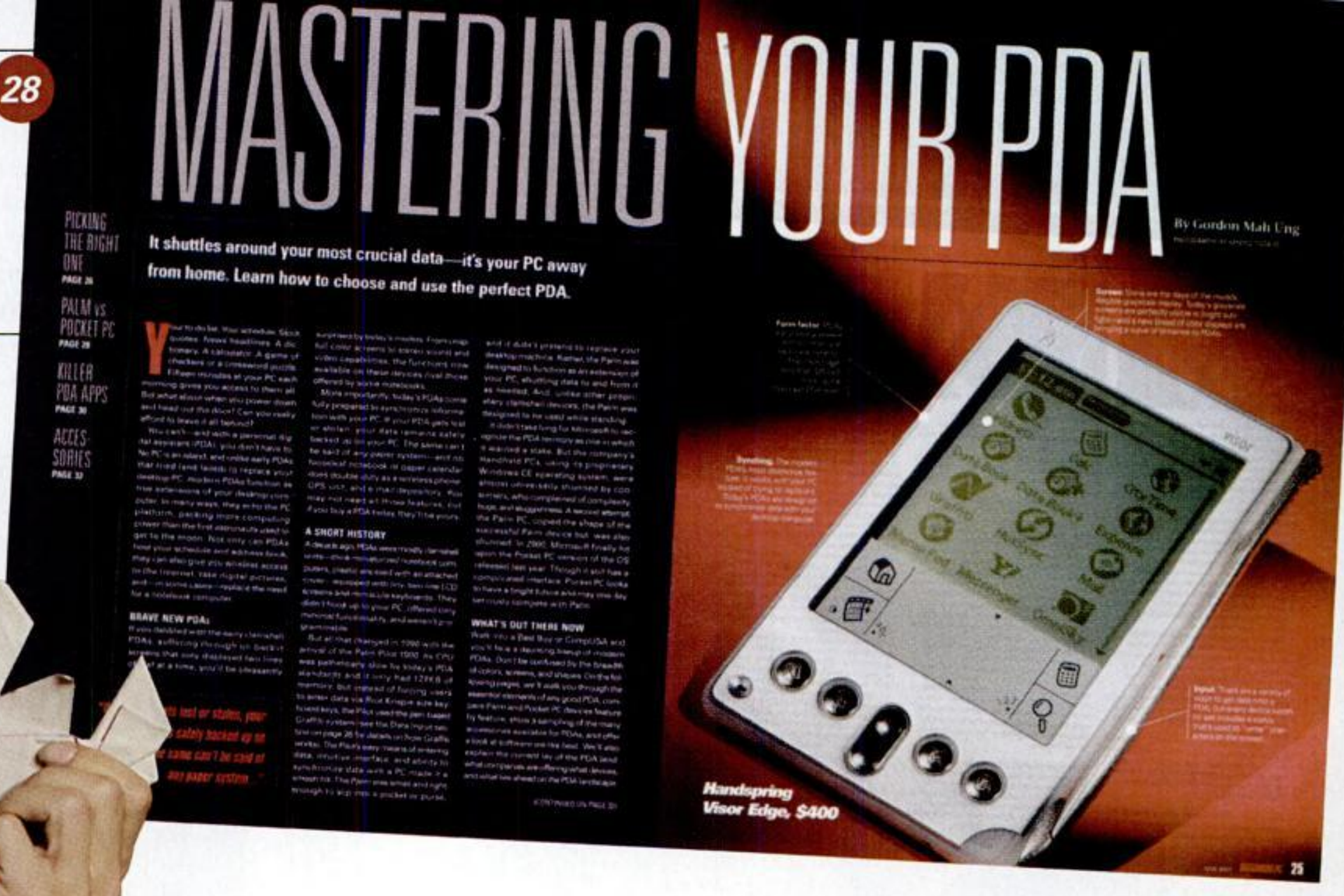
In 2000, we went back to building the ultimate performer: Dual 1GHz P-IIIs, dual 18GB Seagate X15 SCSI drives, and two Plextor CD-RWs. By the time all was said and done, the register had rung up a breathtaking $11,987. (The expense report was quietly submitted late on a Friday afternoon.)

Copyrighted material

28

06/01_The Rebirth

Sick and tired of looking like some kind of podunk trade magazine, we redesigned our pages for a modern aesthetic. Wild splashes of color are nice in an Austin Powers flick, but not in a high-tech mag.


MASTERING YOUR PDA
By Gordon Mah Ung
It shuttles around your most crucial data—it's your PC away from home. Learn how to choose and use the perfect PDA.
PICKING THE RIGHT ONE
PALM VS POCKET PC
KILLER PDA APPS
ACCESSORIES
Handspring Visor Edge, $400

29

10/01_Legend of Origami Master

When we first saw Voodoo PC's fancy cabling jobs, we were awestruck. We had seen decadent paint jobs before, but never such meticulous, precision-detailed interiors. The zenith of Voodoo's magic was revealed in our 38th issue: IDE origami. Fantastic!

30

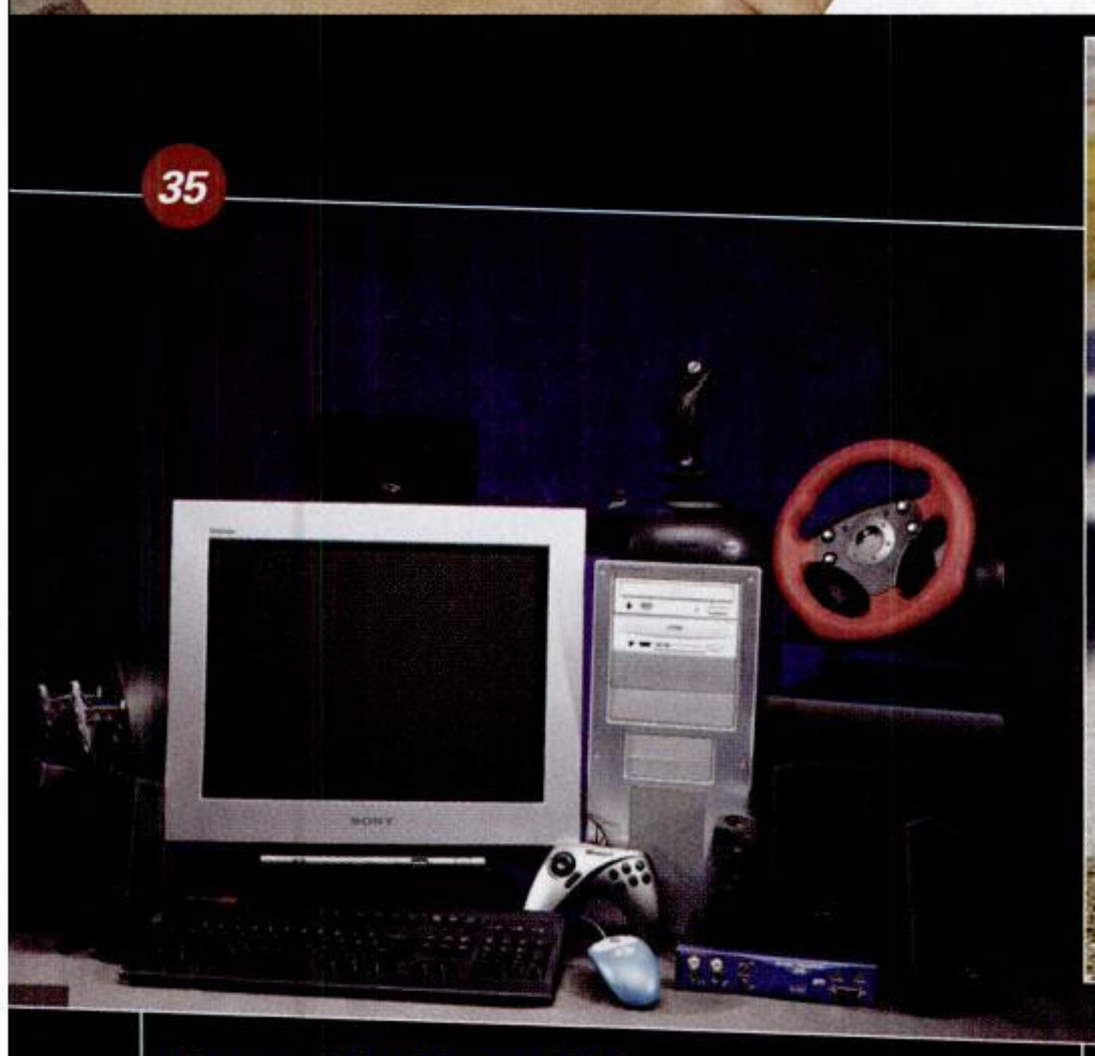
Punishing Review No. 5: AVer Media AVerTV Box

"The shape of the AVerTV Box reminded us of a suppository. On second thought, so did using it." The 3 verdict was more than kind.

31

11/01_This Moment in History, Part 4

Want to instantly piss off a bunch of people? Give a Microsoft OS a Perfect 10 verdict! That's what we did in November 2001. Even though we all agreed it was the OS Microsoft should have *started with*, we couldn't knock it just out of bitterness. DOS finally got the toss, and MS finally delivered a solid, stable, and fast environment that tackled games as swiftly and easily as it crunched numbers.



Dream Machines 2001

Striving to outdo DM2000, we created not one, but three Dream Machines—a no-holds-barred gaming rig, a party-making entertainment center, and the menacing content creation box code-named the Fridge. The configurations alone cost in excess of $17,000. Those were the days.

Dream Machine 2002

This year, we realized that it had become pretty easy to just gather up nice parts, staple them together, and slap the hell out of our benchmarks. We wanted more than just the fastest rig money could buy—we wanted style. And what better way to express your PC's inner ass-kickingness than nine layers of authentic auto paint, vinyl decals, and six layers of clear coat? We also OC'd the hell out of our CPU, and convinced ATI to give us experimental 3D silicon weeks before its intended release.

Copyrighted material

37

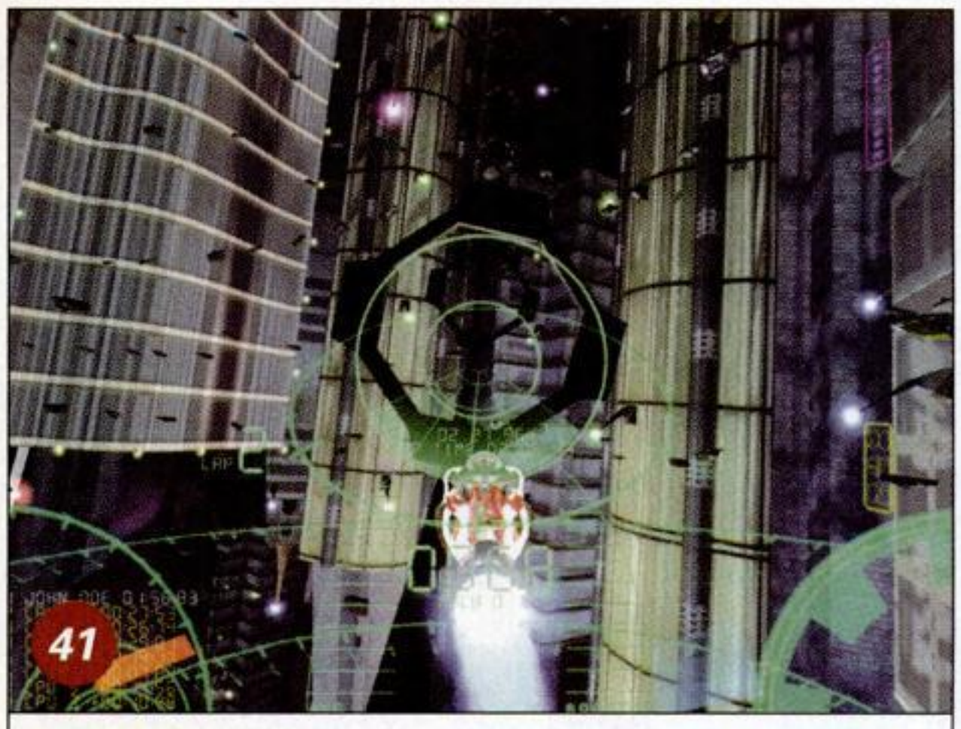
02/02_The Maximum PC Nurse

The vinyl-clad nurse who graced our February 2002 issue raised more than a few eyebrows—among other things—throughout our readership. Some saw her as a warm and compassionate caregiver who assured them that, yes, indeed, she would help cure all their PC woes. Others saw a depiction of nurses as wanton harlots. In the end, the numbers told the real story. The "Heal Your PC" issue was the second best-selling issue in *Maximum PC* history.

What Were We Thinking?

"Note to self: Under no circumstances should you ever again run pictures of male editors in drag or wearing funky fingernail polish. Even more importantly, keep all photos of tech editor Will Smith out of the magazine. His tortured expressions gut and fillet my senses."

–Jon Phillips



02/02_This Moment in History, Part 5

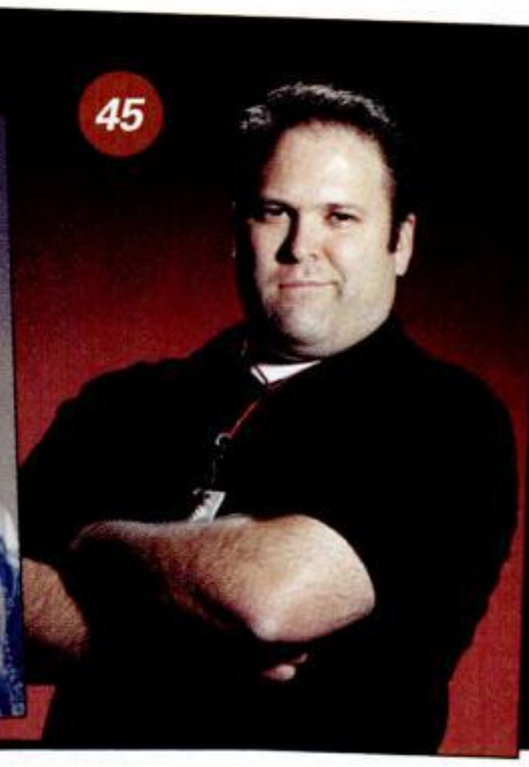
We all bought GeForce3s because when the first DirectX 8 pixel and vertex shader-enabled games arrived, we wanted to be ready. We waited. And waited. Finally, *Aquanox* and *Ballistics* showed a bit of the promise that programmable shaders were hyped for.

42

03/02_IDE overtakes SCSI

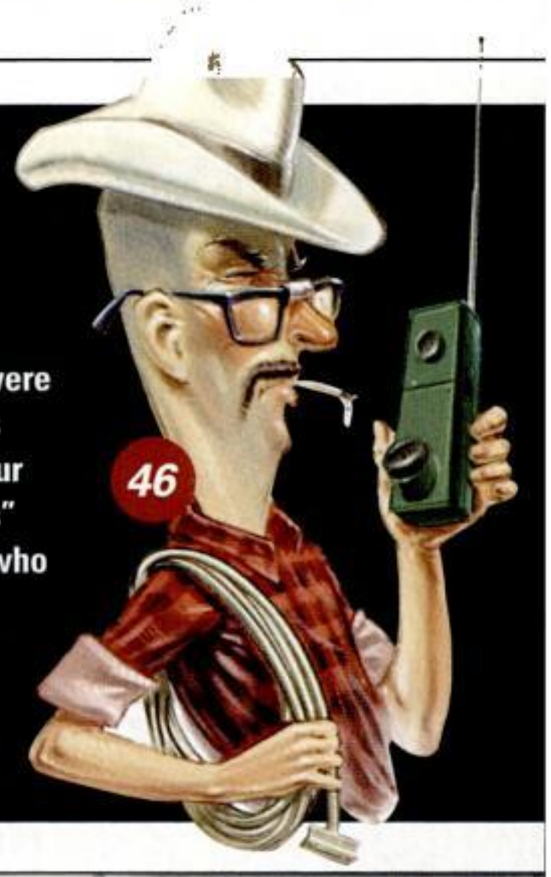
After years of promoting SCSI over IDE, we declared Western Digital's 1000BB Special Edition to be superior to Seagate's X15-36LP—never before had the magazine sided with IDE in a hard drive head-to-head. Although the Seagate did prevail in a number of tests, the margin was scant. When price, ease of configuration, storage capacity, and just plain common sense were factored in, IDE never looked better.

Copyrighted material



Best Supporting Cast

Some of our recurring characters—like Leonard the PC paranoiac—are figments of our own imaginations. Others—like Mrs. Schartung—are real people who were somehow lured into *Maximum PC*'s twisted web. And then you have your "quasi-fictional shadow characters" (Lil'est Intern and Dick Matthews) who straddle the fence between ersatz reality and fact-based fantasy. And if you can make heads or tails of that explanation, you've been reading our magazine for far too long.



06/02_Best Historical Re-Creation

47

In the spread that opened "Secret Weapons of 3dfx," you can practically smell the fear and desperation coming from our frantic scientist. A shout goes out to our design team for masterminding one of the coolest, most ironic photos in *Maximum PC* history.

Who Said What:

48

"There once was a mouse from Nantucket/Whose cord was so long we could chuck it/Across the room/With a resounding boom/Into the non-wireless bucket" —*Anonymous*

06/02_Reader Day 2002

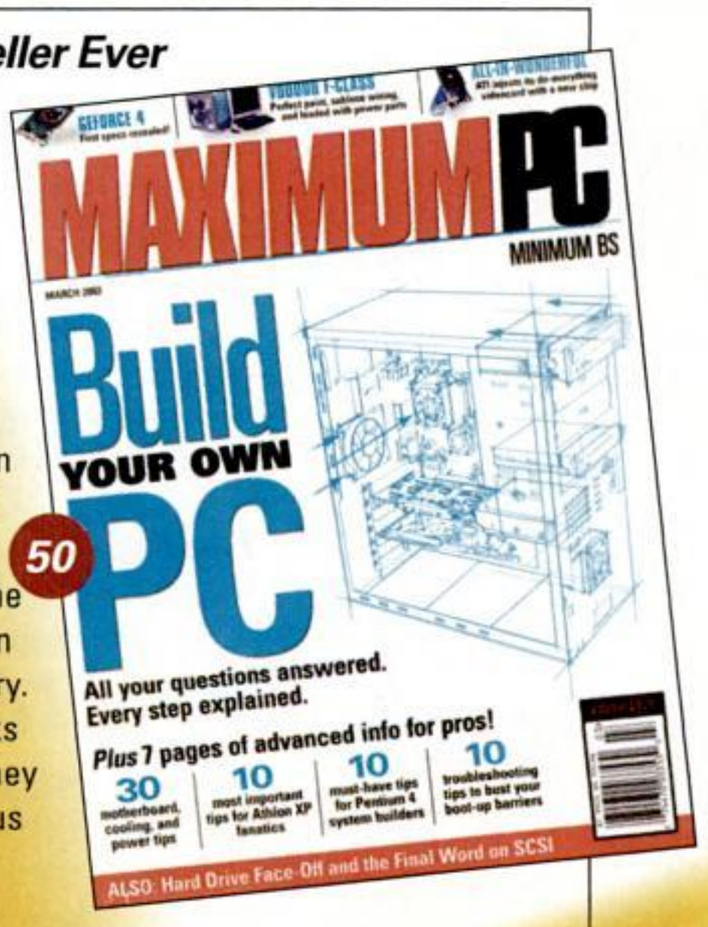
49

Defying all better judgement, we arranged for 15 local Bay Area readers to visit the silicon Wonkaland that is the Maximum PC Lab. Things actually turned out OK—we even met one of our future interns, Johnathan McKinney. Well, OK, maybe not *everything* turned out dandy.

03/02_Best Seller Ever

Fact: All of our readers are passionate PC freaks, but far from all of them are hardcore hardware tweakers. This became patently clear when we saw our "Build Your Own PC" cover emerge as the best-selling issue in *Maximum PC* history. At this point, it looks like only nude Britney photos could give us better newsstand push.

50


GEFORCE 4
MAXIMUM PC
MINIMUM BS
Build
YOUR OWN
PC
All your questions answered.
Every step explained.
Plus 7 pages of advanced info for pros!
30 motherboard, cooling, and power tips
10 most important tips for Athlon XP fanatics
10 must-have tips for Pentium 4 system builders
10 troubleshooting tips to beat your boot-up barriers
ALSO: Hard Drive Face-Off and the Final Word on SCSI

Coming in December 2006—our 100th issue!

- *The Maximum PC Guide to 4D Accelerators—but where are the 4D games?*
- *Martha Stewart on the Ultimate SOPO (Small office/Prison office)*
- *In the Lab—does weightlessness inhibit airflow?*
- *Exclusive—first screens from Doom IV!*

Copyrighted material

Ask the Doctor

Symptom → Diagnosis → Cure

Have a burning PC problem? How about a burning PC sensation? We're more than happy to help you with your PC problems, but you might want to get that sensation thing checked out by a qualified sensation checker-outer. If you have PC questions, send them to **doctor@maximumpc.com**. Just remember: We can't answer every e-mail. Oh, no—not by a long shot.

My Laptop Keeps Me Sane!

I recently bought a refurbished IBM Thinkpad 390X. I love playing RPG games and bought *Heroes of Might and Magic IV*. After installing it on my laptop, the game wouldn't load. It looked like my system met the minimum requirements, but I added even more memory to get a total of 192MB RAM. The game still won't load, and I get a 3D graphics error. I have stock graphics, a Neomagic MagicMedia 256AV. How can I upgrade the graphics on my Thinkpad to run newer RPG games? I'm in the Army in Germany and this is one of the best stress relievers I have here, thanks for your help.

—LARRY VAUGHT

Adjusting the font size in *Internet Explorer* is so easy, we've done it by accident! To adjust font sizes, hold down the Ctrl key and move you mouse wheel.

The Doctor bets that the culprit is bad video drivers, especially since *Heroes of Might and Magic IV* isn't a 3D game (so says our disc producer Greg Vederman, the only staff member to have played the game). You'll have to hit IBM's web site to get the latest drivers, as Neomagic doesn't supply any reference drivers of its own. You might also need a more current version of DirectX. Head to www.microsoft.com/directx and download version 8.1.

Unfortunately, there's no viable way to upgrade the graphics in a laptop. If you want to play more modern 3D games, you'll have to upgrade to a whole new system.

Memo to Internet Explorer: I'm Not Blind

I don't know what happened, but all of a sudden, the font in my *Internet Explorer* window has gotten bigger. When I used to surf the web, the font was a size that I liked, but now its HUGE! Would my problem be fixed if I reinstalled *Internet Explorer?*

—DAVID WANG

We've got a much easier way to fix your problem than the Herculean task of uninstalling and reinstalling *IE*. All you need to do is open *IE*, hold down the control button, then scroll your mouse wheel up to shrink the size of the font (scrolling down will make the font bigger). If your mouse is wheel-less, you can change the font size by going to the View menu, clicking Text Size, and selecting from the options.

Add/Remove Programs is Contaminated!

My Windows XP was recently infected by an old virus called w32magistr that moved my desktop icons so that I couldn't reach them with my mouse! Surprisingly, *Norton Antivirus 2002* did not detect it, but *F-Prot*, a free antivirus program downloaded from the net, did. After the 30-day trial period, I removed this software by simply deleting its files. Now, the Add/Remove Programs Control Panel applet still shows the *F-Prot* program in its list. When I try to delete it, I get the following message: "An installation support file could not be installed. The system cannot find the file specified." My question is: Do you know any way to completely remove all traces of *F-Prot* in my PC?

—GIAMPAOLO TALAMO, MD

Simply deleting the directory will leave unneeded orphan files strewn about your hard drive.

The fact is, simply deleting the directory will leave unneeded orphan files strewn about your hard drive. Fortunately, there are a couple ways to remove an invalid entry from your Add/Remove Programs panel. The easy way is to reinstall the software to the exact same directory that you installed the program in before, then uninstall it using the Add/Remove Software Control Panel.

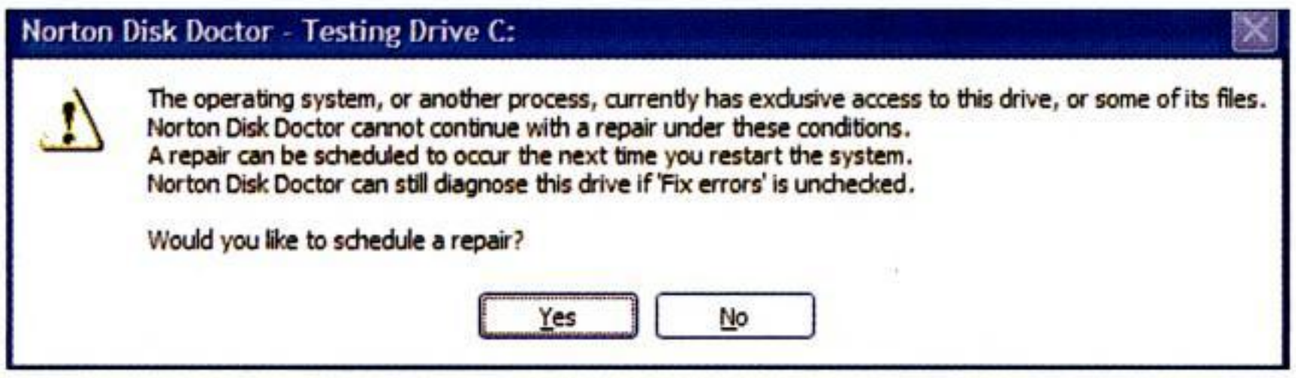
If you don't have access to the offending app in order to perform the reinstall/ removal, you can extradite the app through the Registry. Open the Registry Editor by going to Start, then Run, and typing Regedit and hitting Enter. Browse down the Registry to HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall, and remove the folder that corresponds to the unwanted app. Generally, the folder bears the same name that shows up in Add/Remove Programs, but to be sure you're removing the correct app, open the folder and look for a registry key called "DisplayName." That's where you'll find the definitive wording displayed in Add/Remove Programs. Be careful when editing the Registry. If you delete the wrong key, you can seriously damage your machine.

How Can I Convert WMA to WAV?

I'm having a problem with *WinAmp's* inability to change certain files into WAVs. Some music files from a CD I put on my hard drive will not convert into WAVs. The extension on the files is .WMA. What process should I use to convert them, or do I need new CD mastering software?

—TIM PRYBOR

Copyrighted material


Norton Disk Doctor - Testing Drive C:
The operating system, or another process, currently has exclusive access to this drive, or some of its files.
Norton Disk Doctor cannot continue with a repair under these conditions.
A repair can be scheduled to occur the next time you restart the system.
Norton Disk Doctor can still diagnose this drive if 'Fix errors' is unchecked.
Would you like to schedule a repair?
Yes
No

Popup dialog boxes, like this one, are frequently chock-full of useful information!

Those mysterious WMA files are Windows Media files. To convert them to WAV files, grab a player that's a little more comfortable with the audio format, such as the *Advanced WMA Workshop* (www.litexmedia.com). This program can convert files from WMA to WAV, Ogg Vorbis, or MP3 on the fly.

Why Does XP Hate My RAID?

I have an Asus A7V333 mobo with RAID and FireWire. I loaded Windows ME, *Office 2000*, and all the drivers and software for the Lite-On burner onto my Western Digital hard drive. I hooked up everything and plugged the hard drive into the Promise RAID controller. Upon booting, I was instructed to configure the array and I did. It booted just fine. I have a single 60GB WD set to master on the Promise RAID controller. The burner and DVD-ROM drive are on their own IDE channels as masters. Everything worked fine.

Then I decided to switch to Windows XP, and I decided to do a clean install of XP Professional instead of upgrading. When I boot from the XP CD, it doesn't see the hard drive. When I booted with a Win98 startup disc, it saw the drive and created a partition and formatted it. Then I tried to start the XP install by going to the E: drive (where the XP CD was) and browsing to the i386 directory and running winnt.exe. It copied the files to the C: drive. When the install started, it still couldn't see the HD. What is wrong with this board?

—KEVIN G.

The Doctor's got good news, and bad news. The good news is that nothing's wrong with your board. XP needs drivers to know how to talk to your RAID controller. But the bad news is that you're not going to be able to use your RAID controller with just one hard drive (RAID arrays, by definition, have more than one disk).

To fix your problem with XP, first get drivers for your controller from the Promise web site and load them on a floppy disk. Start the XP install, then press F6 when the install prompts you during the text-mode phase of setup to install third-party drive controllers. At that point, you can insert the disk with the drivers and continue with the install process.

On the other hand, because you're using just one hard drive, and thus unable to take advantage of the RAID controller, you can simply plug the hard drive into one of the motherboard's standard IDE ports, then install Windows XP.

Read the Dialog Box? Yes/No

All right, I'm stumped. I just installed XP Pro. I went out and bought *Norton Systemworks 2002* since *2001* isn't compatible with XP Pro. Anyhow, everything works great (they even left out the more annoying features such as "optimize my registry"), but I cannot get Disk Doctor to fix any problems. It claims that the operating system, or another process, currently has exclusive access to this drive and cannot repair under these conditions. Is this a byproduct of XP? What can I do to work around this.

—JASON DEEKEN

Windows XP is much more protective of its filesystem access than are Windows 98 and ME. Disk Doctor won't ever be able to run on the drive that includes the OS and swapfile. The message that you're getting is almost certainly this one:

"The operating system, or another process, currently has exclusive access to this drive, or some of its files. Norton Disk Doctor cannot continue with a repair under these conditions. A repair can be scheduled to occur the next time you restart the system. Norton Disk Doctor can still diagnose this drive if 'Fix errors' is unchecked. Would you like to schedule a repair?"

If you took the time to read this dialog box, you'd know that selecting "yes" would make Disk Doctor run the next time you reboot your system. This would repair any problems with your XP drive. See, not everything presented to you in a dialog box is worthless!

Where Did All My Free Space Go?

Lately one of my computer's hard drives has been running very low on space. The computer has two hard drives, a 13GB and a 15GB. All games are installed on the 15GB drive and there's plenty of space on it. The 13GB drive has a few small programs installed, but the drive has less than 1GB of free space left. I checked all files and folders, but wasn't able to find out what was taking up all the space.

Then I realized that there were hidden folders I couldn't check, so I set Windows to show hidden files and, BAM, I found the folder. It's labeled _RESTORE and has a lot of text after it. The folder contains over 50,000 files adding up to 4.77GB of space. I decided to make a system restore mark, then tried to delete the folder. When I did, it deleted some of the stuff in the folder, but then a warning message came up saying "Cannot delete DSINFO. Access denied. The source file may be in use." I would really like to know what this file is, how it got there, and how I can get rid of it.

—SCOTT HINNEN

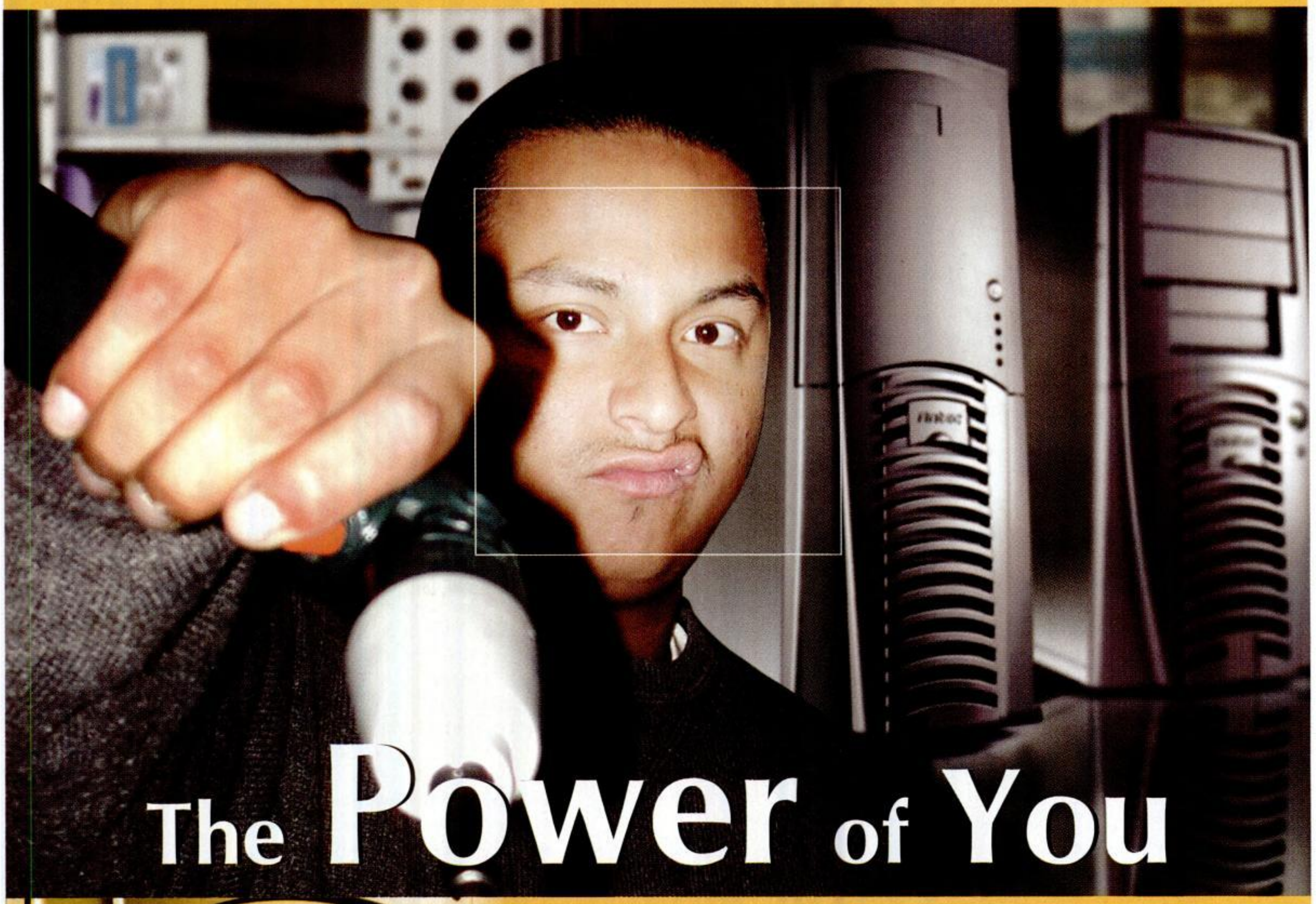
Your letter gave the Doctor a pretty good giggle, Scott. You see, the folders that begin with _Restore almost always contain System Restore information. All you need to do to reduce the amount of space that folder is taking up is go to the System Control Panel (right-click My Computer, then go to Properties). Click the System Restore tab and select Settings for the drive you're having problems with. In the next window, you can adjust the maximum amount of drive space that System Restore will reserve on your 13GB drive. The Doctor recommends allocating 500 to 600MB, which should allow around 10 to 12 restore points, without eating too much of your hard drive. ■

Read this, or the kitty gets it!

Random crashes? Spontaneous reboots? 3D game glitches? Your problem is likely out-of-date drivers for your mobo. Most of the problems the Doctor hears about could be solved with a chipset-driver update. Upgrade chipset drivers every time you update your video drivers and stop harassing the Doc... and the kitty will escape an almost certain trip to the flea bath.

- Grab the latest Intel chipset drivers at: **www.support.intel.com**
- Get Via's latest drivers at: **www.viaarena.com**
- AMD's drivers are nestled at: **www.amd.com**
- SiS's drivers are at: **www.sis.com**

Copyrighted material



Copyrighted material

How To...

A step-by-step guide to tweaking your PC Experience

TAME YOUR CASE WIRING!

Everything you need to know about keeping those cables out of trouble

BY BRIAN LAM

MAXIMUMPC
TIME TO COMPLETION
01:12
HOURS MINUTES

The art of case wiring has never been more important. The latest videocards and CPUs can fry bacon, and as we've been telling you for 50 issues now, tidy case wiring is essential to letting cool air flow fast and free throughout your PC's interior.

Of course, even if you don't give jack about performance, pure vanity might compel you to clean up your act: If you want to show off the inside of your box, you better get your power and drive cabling in order first. No one is going to give props to a windowed case with a rat's nest inside.

Bottom line: If you call yourself a PC enthusiast, you have to clean up those wires. Here's the short story on how to take your first baby steps toward the level of achievement exhibited by Voodoo on page 32. Those cats in Canada use traditional origami skills to keep their wires in line, but you can achieve nice results with inexpensive parts available online.

What You'll Need

- Split wire loom (1-inch, 1/2-inch, and 1/4-inch widths), available at **Radioshack.com**
- Wire ties, available at Radioshack.com
- Rounded drive cables, available online at **Plycon.com**
- Scotch tape
- Pen
- Scissors

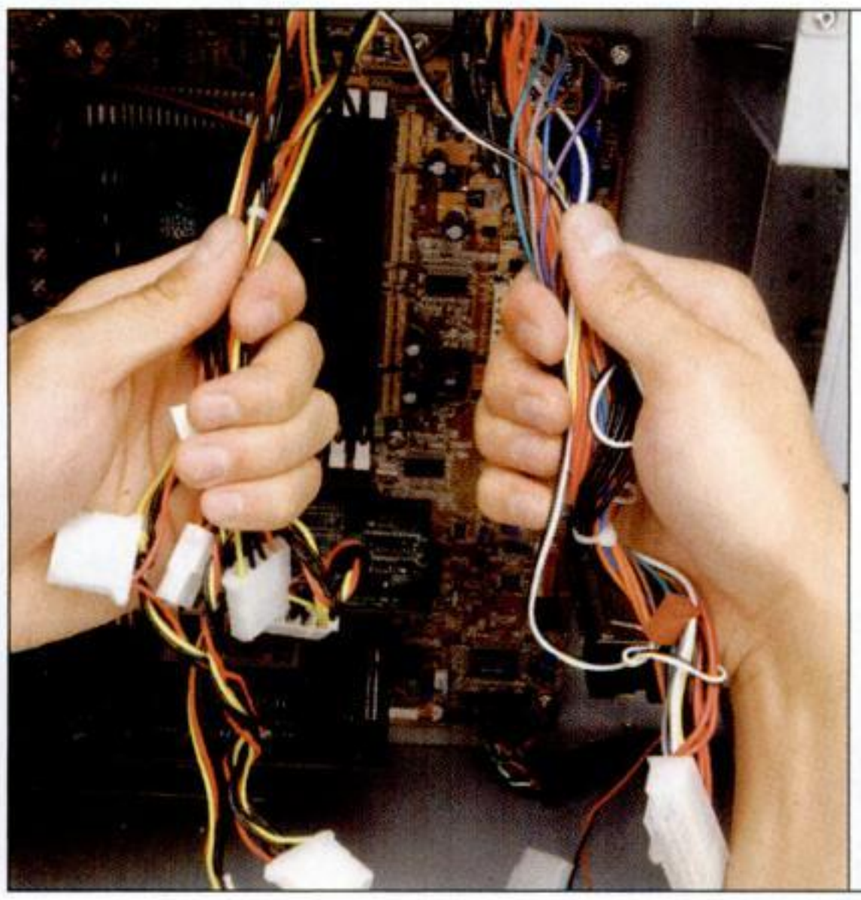
Copyrighted material

Power Cable Management

Power supply cables easily make up the bulk of spaghetti in your case, and are the most complicated to wrangle. So, being the fearless gents we are, we'll start here.

Step 1: Do Over, Do Over!

Before you can begin elegantly wiring your case, you've gotta do some spring cleaning. Unplug your computer, ground yourself, open up the case, and disconnect your power supply connectors. While you're at it, remove all ribbon cable, fan wires, LED wires, and case switch wires, because they'll only get in the way once you get busy. If you think you may forget how to reconnect everything, label the various wires using scotch tape and a pen. If anything is tangled, straighten it out.



Step 2: Be a Man with a Plan

Now that you've removed the spaghetti that was your messy wiring setup, you're going to determine how to plug things back in intelligently. Again, the objective is to find routes for wires that don't block airflow. Look for ways to route wires through holes, in corners, and along case edges. Also, you should begin to think about which sets of leads can be bundled together in common looms (which we'll get to in the next step).

For example, most cases will have two groups of power supply cables. One group will congregate at the top of the case, because they'll all be heading toward optical drives. The other group will loiter around the bottom, because they'll be heading for hard drives and intake fans. Think about the directions in which your power supply cables are headed, and group them accordingly. Just be aware that each case configuration is different, so really take the time to think about planning the best routes.

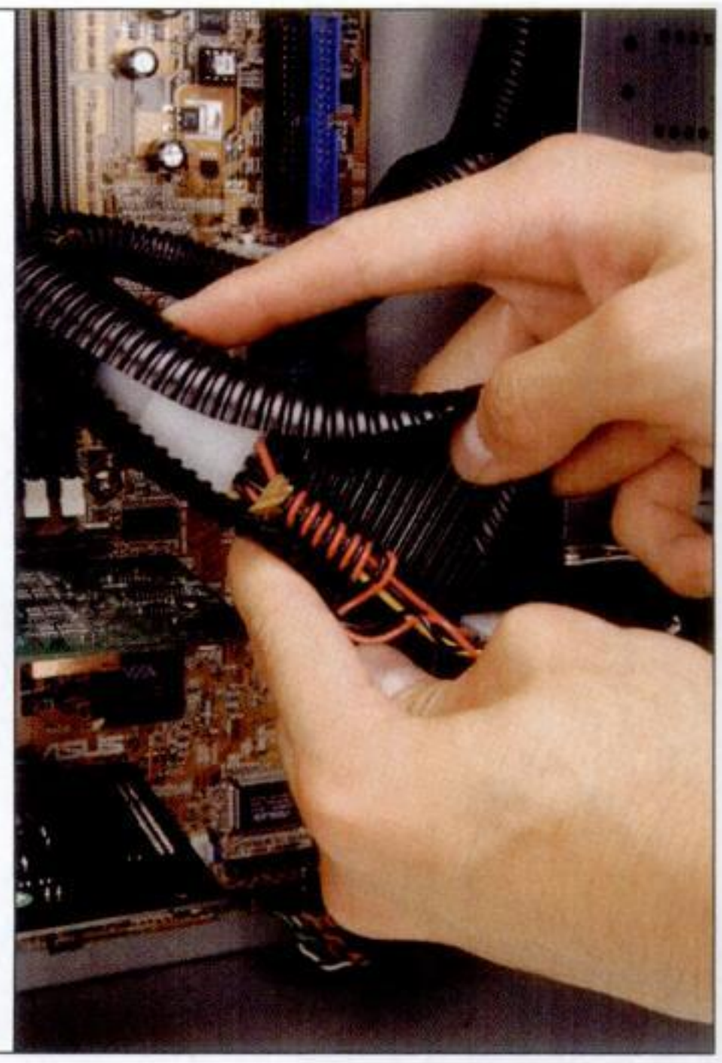
Remember that at this point, you're just planning—you don't want to finalize any wire placements until the whole interior project has been checked off as a cohesive unit. Once you've got a vision of what will go where, you can move on to the next step: covering your wires.

Step 3: All Dressed Up

Break out the different-sized wire looms and wire ties. When trying to understand what part each will play in neatening up your case, it helps to think about it like this: In the war against interior clutter, the looms are like tanks, and the wire ties are the special forces. The looms have no problem gracefully swallowing a grip of cables, but when it comes to a single misfit wire dangling precariously near your CPU fan, the wire tie is the soldier for the job.

You'll need to begin covering all of your major wire bundles with split wire loom. It's as easy as putting your fingers between the split, and slipping the entire loom over the wires. Your goal is to cover your wires in a "tree" pattern. Begin by creating a "trunk" of wires—cover everything coming out of your power supply with a 1-inch diameter piece of loom. When the trunk bundle reaches the point where different wires need to diverge, cut the 1-inch loom appropriately, and cover the "branches" with thinner sections of loom. After another branch or two, you should be near the end of the line. Now go ahead and reconnect your power supply connectors.

Once you've examined your fine looming work, you'll probably notice that your pretty, loomed wires still seem to be astray in the case. Add discipline and form by latching down the bunches with wire ties. Tie the looms to the rails and edges of your case. You can even tie them to other sections of loomed wire. While you're finalizing your wire locations, remember not to block airflow. Note that wire ties are a one-way trip. If you want to remove them, you'll have to carefully snip off their heads.



Copyrighted material

See the new Aluminum Mid-Tower Case, Turbo-Cool® 475, and SleekLine® 2400 P4 System at pcpowercooling.com

Cool Computer Upgrades.

POWER SUPPLIES

"If you're building a machine you need to trust, go with PC Power & Cooling products. Get its case, power supply (the best, period), and CPU fan."

John Dvorak

ECONOMICAL

Save on quality UL recognized power supplies.
STANDARD 145 SFX-L (eMach., HP67XX, more)
STANDARD 250 ATX

ULTRA-QUIET

Unrattle your nerves with a **Silencer®** power supply. Its high-efficiency fan and low-turbulence circuitry reduce noise by up to 90%. **You'll wonder if it's on!**
SILENCER 150 1U
SILENCER 275 ATX
SILENCER 400 ATX (PFC option)

HIGH-PERFORMANCE (STD & DUAL CPU M/Bs)

For power that won't skip a beat during drive access or utility sags, upgrade your PC with a premium **Turbo-Cool®** unit. You'll get **50%-100% more power**, built-in line conditioning, tight regulation, ultra-clean output, enhanced cooling, UL/ULC, and 3-5 year warranty!
TURBO-COOL 180 SFX
TURBO-COOL 300 1U-PFC
TURBO-COOL 300 SLIM
TURBO-COOL 300 ATX (PFC option)
TURBO-COOL 350 ATX
TURBO-COOL 425 ATX (PFC option)
TURBO-COOL 475 ATX-PFC
TURBO-COOL 475 A4-PFC (Tyan 2462, 2468, more)
TURBO-COOL 475 XE-PFC (SuperMicro P4DC6, more)
TURBO-COOL 600 PFC (Tower, ATX, or Sun)

REDUNDANT POWER

For *mission-critical* reliability (2 million hrs.), get our high-capacity **DualPower 840 System**. Shown with Tower Case.

DUAL-POWER™ 840 PFC (ATX, A4, or XE)

ENCLOSURES

ECONOMICAL MID-TOWER

Build your own PC! It's easy with this popular case.
PERSONAL MID-TOWER CASE

HIGH-END MID-TOWER

This handsome, precision-built **all-aluminum** case has it all: 12 bays, 3 aux. fans, 4 front USBs, 5-in-1 M/B cable, removable M/B tray, and *toolless* access! Holds single or **dual CPU M/Bs**.
ALUMINUM MID-TOWER CASE

HEAVY-DUTY FULL-TOWER

Distinctive style, heavy-duty construction, full-size M/B compatible, 10 bays, extra cooling and EMI suppression. You can't beat our **all-steel, USA-made** full-tower cases! Std. beige or deluxe version with casters, bold black finish, and a **bright chrome** bezel.
SOLID-STEEL TOWER CASE
DELUXE CHROME TOWER CASE

SLEEKLINE® SYSTEMS

The feature-rich **SleekLine® 2.4GHz Pentium 4** System packs **more power** in **less space** than any other desktop computer. Beats PC World's Top 15 PCs!

PERFORMANCE COMPARISON

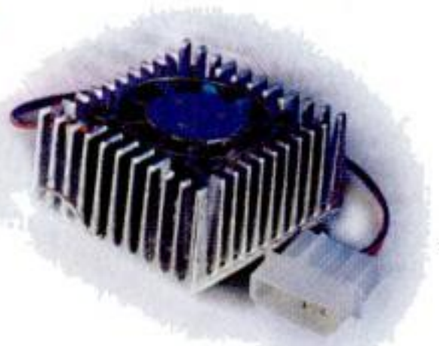
COMPUTER	SIZE (cu. in.)	PERFORMANCE[1]
SleekLine® 2400	565	129
Dell™ 8200 (2GHz)	2087	119

[1] PC WorldBench 4 score running Windows 2000 (higher no. is better).

The SleekLine 2400 comes with 256MB RAM, 120GB HD, DVD/CD-RW combo, 10/100 E-net, high-res. 3D video, and **versatile, space-saving**, USA-made case that can be desk-bottom mounted, stacked, or carried!
SLEEKLINE 1000 (1GHz Pentium III)
SLEEKLINE 2400 (2.4GHz Pentium 4)

CPU COOLERS

INTEL®



Processors run hot, often over 230°F! Cool'em by 90°F-140°F with genuine **CPU-Cool™** coolers. Their long-life, ball-bearing fans are *integrated* into patented, die-cast heat sinks. **Last 10 times longer** than cheap imitations! USA-made. 5-year warranty.
CPU-COOL 1.9W (150-200 Pentium)
CPU-COOL M1 (Pentium II, III, SECC2)
CPU-COOL Z1-C (Celeron, PGA 370)
CPU-COOL Z1-HF (Pentium III, FC-PGA)
CPU-COOL 1U (Pentium III, FC-PGA,1U)
CPU-COOL 478 (Pentium 4, Skt 478)
DUAL CPU-COOL X2 (Xeon, Slot 2, redundant)
DUAL CPU-COOl P4 (P4, Skt 423, redundant)

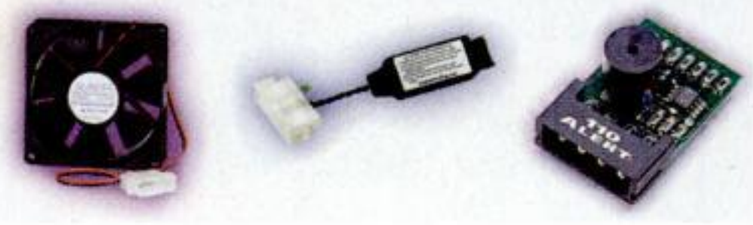
AMD®

CPU-COOL Z1-H (K6-2, K6-3)
CPU-COOL AG (Athlon/XP/MP)

HARD DRIVE COOLERS

Heat *distorts* hard disk platters! Cool your drives by 20°F-40°F with our reliable, solid-steel **Bay-Cool.**
BAY-COOL DRIVE COOLER (1 drive)
BAY-COOL III DRIVE COOLER (1-3 drives)

ACCESSORIES



ATX-to-AT CONVERSION CABLE
PC POWER'S ATX POWER SUPPLY TESTER
TURBO-COOL® 2X AIR PROPULSION SYSTEM
BUSS-COOL DUAL-FAN CARD COOLER
VIDEO-COOL GRAPHICS CARD COOLER
SILENCER® AUXILIARY BALL-BEARING FANS
110 ALERT® OVERTEMPERATURE ALARM
SLEEKLINE DESKBOTTOM MOUNTING BRACKET
SLEEKLINE 19" RACKMOUNT BRACKETS
SLEEKLINE DRIVE AND PCI CARD OPTIONS

17th Anniversary

PC POWER & COOLING, INC.

1985-2002

www.pcpowercooling.com • 5995 Avenida Encinas, Carlsbad, CA 92008 • (760) 931-5700 • (800) 722-6555

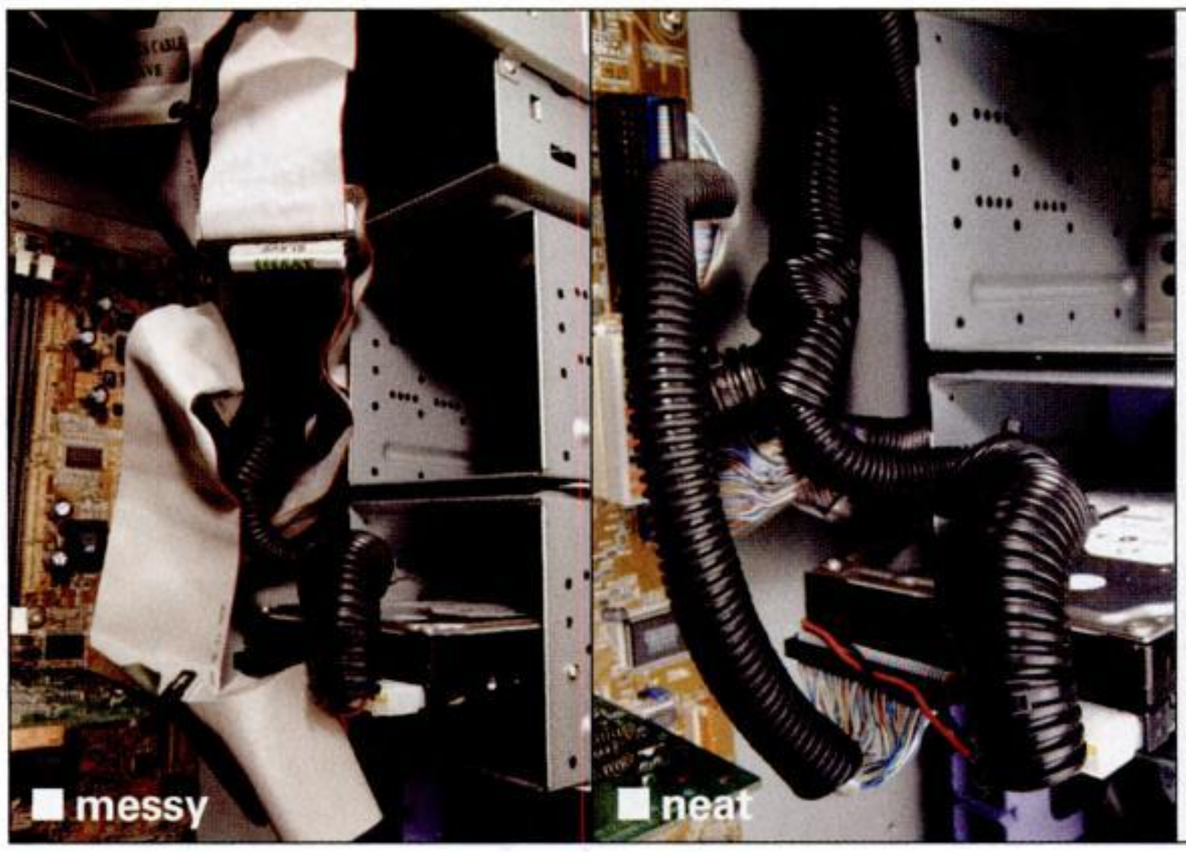
Hours: 7 a.m.-5 p.m. (PT) Mon.-Fri. Terms: Visa, MC, AE, COD, or PO. Warranty: 5 years for Turbo-Cool (400-600), CPU-Cool, and Bay-Cool; 3 years for Turbo-Cool (180-350), DualPower, and SleekLine; 2 years for all others.

SleekLine, Silencer, Turbo-Cool, DualPower, Dual CPU-Cool, and 110 Alert are trademarks or reg. trademarks of PC Power & Cooling, Inc. All other trademarks are properties of their respective owners. © 2002 PC Power & Cooling, Inc.

Copyrighted material

Drive Cables

Ribbon cables are the number-one problem preventing good airflow in PCs right now. Here's how to tame your drive cables once and for all, at least until Serial ATA hits shelves.



Step 4: Round, Round, Get Around

It wasn't too long ago that PC tweakers resorted to all sorts of ribbon-cable voodoo to promote case airflow. Enthusiasts folded, rolled, and even sliced cables to transform their unwieldy IDE and SCSI cables into shapes remarkably similar to the rounded cables so easily purchased today. Ah, the march of progress! Despite early controversy and rumors that rounded cables can cause data corruption, it's clear today that rounded cables are an essential ingredient for all power boxes. Still, it helps to play it smart:

➤ Buy rounded cables from a reputable source. Better to be safe than sorry.

➤ When swapping out old cables, make sure to connect your drives in the proper master/slave and channel configurations.

➤ For a consistent look, place split wire loom over your rounded cables and wire-tie them alongside your freshly loomed power supply wires.

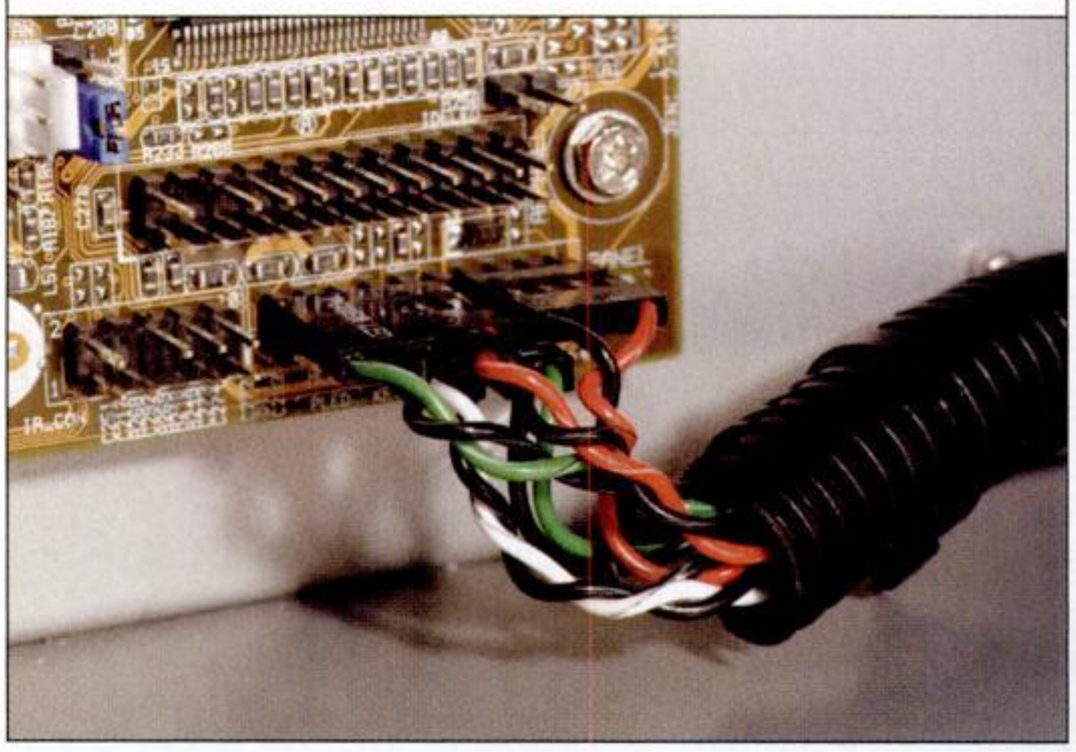
Case Fans, LEDs, and Switches

Don't let your motherboard header cables get the better of you. Take control NOW!

Step 5: Odds and Ends

Since many of your interior wires aren't obnoxious enough to warrant tying them individually, you should just bundle them together if they're within proximity of each other (case switch and LED wires generally all travel from a single area, so they're prime candidates). It's often even feasible for these small-fry wires to hitch a ride in an existing loom. Another option is to route these wires underneath PCI cards, or even under the motherboard.

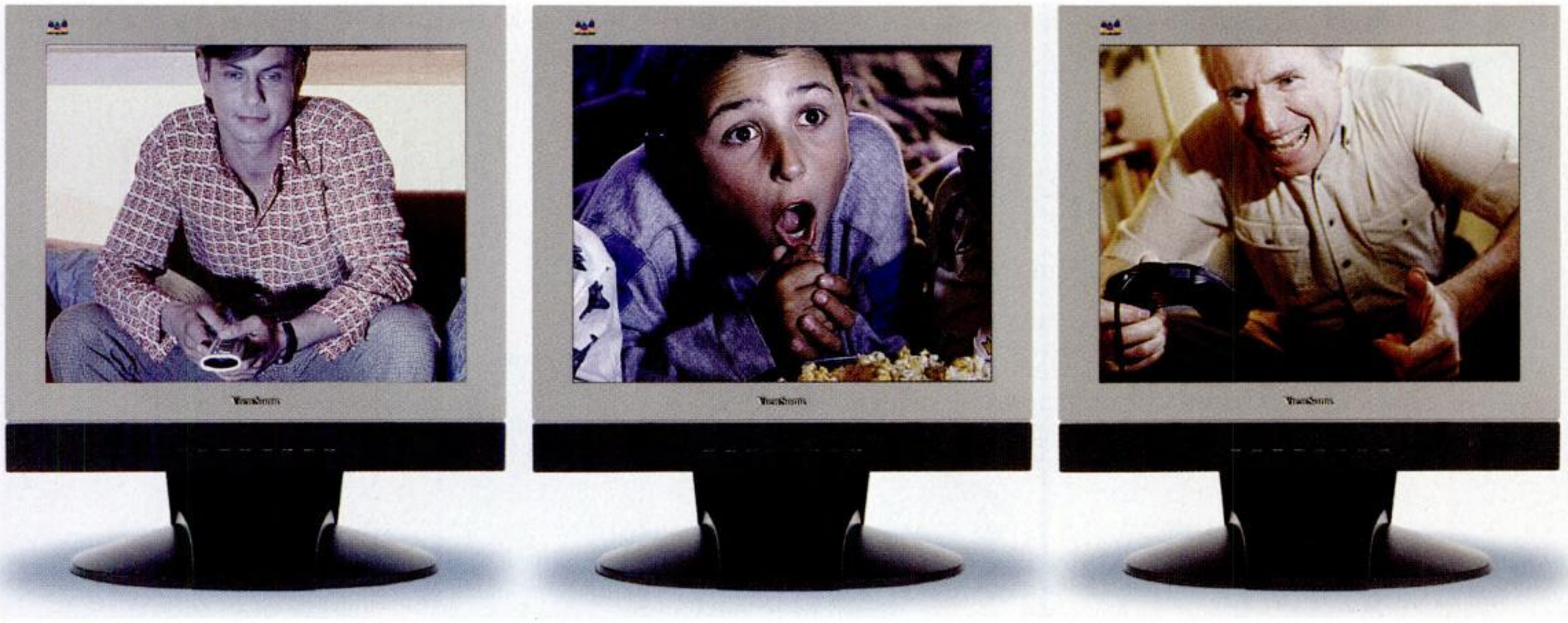
Creativity is key, and given enough cable slack, you can tuck that wire anywhere. ■



(We're done!)

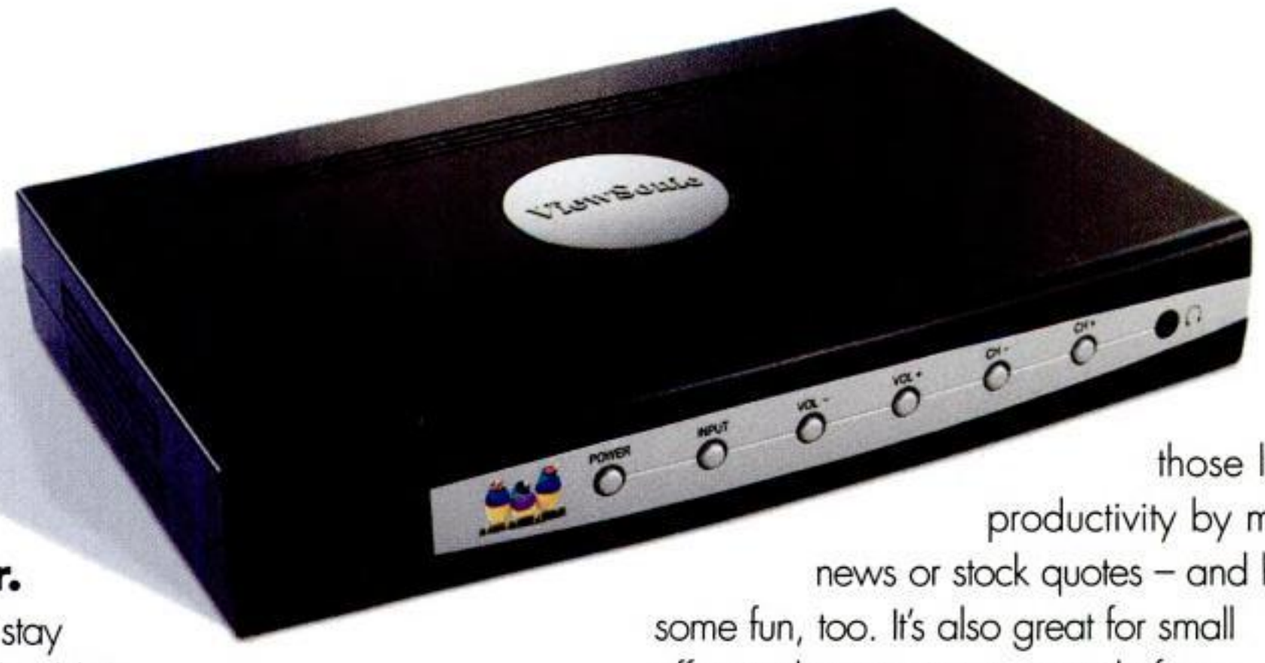
Copyrighted material

Be all that you can be.



CHANNEL SURFER MOVIE GOER VIDEO GAMER

Without ever leaving your desktop.



NextVision™ N5 from ViewSonic.® It turns your display into a high-resolution TV, gaming and multi-media center.

You multitask every day. To stay competitive, you have to. Shouldn't your computer monitor do the same? ViewSonic, the Visual Technologies™ leader, introduces a revolution in desktop productivity and convenience. The new NextVision N5 Video Processor transforms any CRT or LCD monitor into a powerful multi-media viewing center. Connect a cable feed or antenna and with the press of a button, switch from your computer application to full screen, ultra high resolution television viewing (up to 1024x768) via the built-in TV tuner. NextVision N5 also connects DVD players, VCRs and digital cameras. Even plug in your Xbox,® PlayStation2® or Nintendo® for a visual gaming experience like none you've seen before. Complete with 28-key remote control, NextVision N5 is the perfect desktop addition for those looking to maximize productivity by monitoring television news or stock quotes – and have some fun, too. It's also great for small offices where space is too tight for a separate computer display and television. Setting up NextVision N5 is as easy as a TV. No complicated cards or software to install. Use the included cable to connect the NextVision N5 directly to your monitor (you don't even need a PC). Turn an ordinary desktop into an extraordinary viewing experience. Visit ViewSonic.com today and See the Difference.®

EZ Set-up with RGB in/out, S-Video input, Video Input, Stereo Audio inputs, audio line in and speaker out. Just plug and play.

Availability, pricing and specifications subject to change without notice. Corporate names and trademarks herein such as Sony® PlayStation 2,® Microsoft® Xbox® and Nintendo® are the property of their respective companies. Copyright © 2002 ViewSonic Corporation. All rights reserved. [10635-01B 08/02]

ViewSonic®
See the difference.®

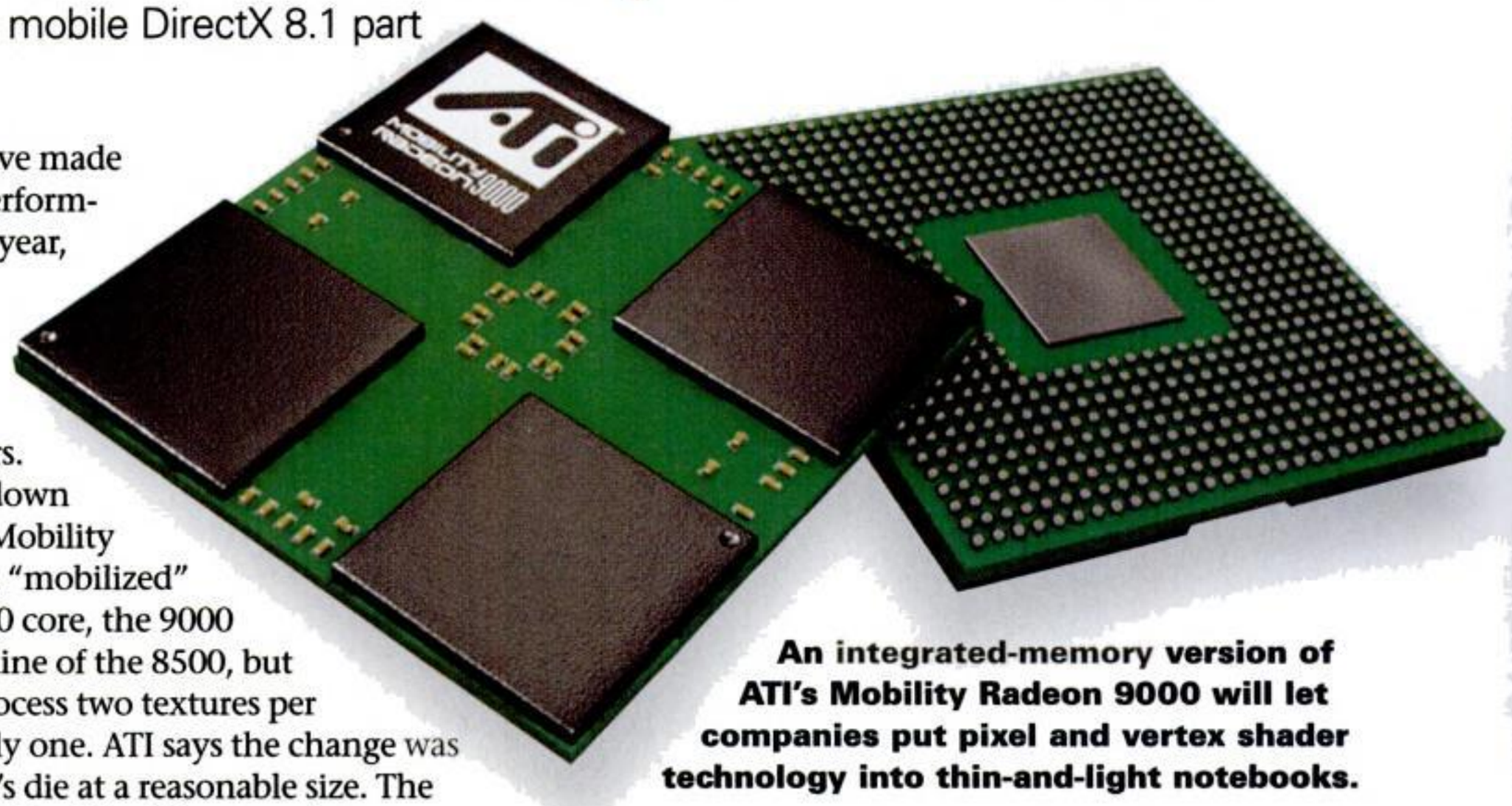
Copyrighted material

In the Lab

A behind-the-scenes look at Maximum PC testing

Exclusive Preview: ATI's Mobility Radeon 9000

ATI beats the competition with the first mobile DirectX 8.1 part



An integrated-memory version of ATI's Mobility Radeon 9000 will let companies put pixel and vertex shader technology into thin-and-light notebooks.

The desktop Radeon 8500 contains 60 million transistors, while the Mobility Radeon 9000 has 36 million transistors.

Notebook graphics have made quantum leaps in performance during the last year, but they've always lacked one key feature that's kept them behind desktop chips: support for vertex and pixel shaders. ATI, however, has busted down this final barrier with the Mobility Radeon 9000. Essentially a "mobilized" version of the Radeon 8500 core, the 9000 retains the four-pixel pipeline of the 8500, but instead of being able to process two textures per pipeline, it can process only one. ATI says the change was necessary to keep the chip's die at a reasonable size. The desktop Radeon 8500 contains 60 million transistors, while the Mobility Radeon 9000 has 36 million transistors (both chips are based on a 0.15-micron process).

ATI says the Mobility Radeon 9000 is a full DirectX 8.1 part. To test that out, we fired up several benchmarks that would tax the chip's shaders. The first was MadOnion's *3DMark2001 SE*—specifically, the Game 4 Nature demo that seems to imitate a Coors commercial with flowing water and rustling leaves. With previous generations of graphics chips (such as the Radeon Mobility 7500 and GeForce4Go 440), the benchmark failed to run. But when loaded on a new Compaq Presario 2800 notebook equipped with a 2GHz Pentium 4M and a Radeon Mobility 9000, Game 4 kicked in full force at 20.4fps at 1280x1024. This score falls short of the 31.1fps our zero-point desktop systems pumps out, but remember, the Compaq is a notebook, and our zero-point system actually features a GeForce4 Ti 4600. Also, up until the introduction of the ATI Radeon 9700, 31.1fps was blisteringly fast.

Compaq's new Presario 2800 gave us our first experience with pixel and vertex shaders in a mobile device. Next up, a DirectX 9 PDA?

The Compaq 2800/Mobility Radeon 9000 combo also produced 6,433 3DMarks, roughly 30 percent more performance than we've seen from a notebook equipped with a Mobility Radeon 7500 and 2.4GHz Pentium 4.

The initial Mobility Radeon 9000s will run core clocks of 250MHz, while memory will clock in at 190MHz. As faster memory becomes available, it should crank up to 230MHz. The Mobility Radeon 9000 we tested was teamed up with 64MB of discrete 128-bit memory, and ATI says future configs will feature 128MB. ATI also says integrated memory is on-deck. One configuration will feature 32MB of 64-bit RAM integrated into the graphics core, and support an additional 32MB of discrete 64-bit memory. The other configuration will feature 64MB of 128-bit memory integrated into the core.

ATI says the Mobility Radeon 9000 is a "real" mobile chip, meaning it isn't just a desktop chip strapped into a notebook. The company says the power-saving modes which are used in its other mobile chips are also present in the Mobility Radeon 9000. That means big things for thin-and-light notebooks. ATI says consumers should expect miniature-size notebooks with full-blown pixel and vertex shader technology by early next year. However, full-size notebooks based on the Radeon 9000 should be available by the time you read this, and we plan to have a full review of Compaq Presario 2800 in our next issue.

BATTLE OF THE BENCHMARKS	MOBILITY RADEON 9000
3DMark Game 2, 1024x768	51.3 fps
3DMark Game 4, 1280x1024	20.4 fps
3DMark Overall	6,433 Marks
Comanche 4, 1024x768	25.68 fps
Code Creatures, 1024x768	10.4 fps
Unreal Tournament 2003 Inferno, 1280x1024	15.3 fps
Unreal Tournament 2003 Inferno, 1024x768	24.9 fps

NOTE: So why no full review of the notebook? ATI swears that its OpenGL works fine, but we experienced issues that prevented *Jedi Outcast* and *Quake III Arena* from running correctly. This isn't a surprise considering the OpenGL problems ATI had in our September 2002 Head2Head.

Copyrighted material

Holy Controlly!

Kenton Control Freak

If fiddling with software synthesizers is your thing, then you know that the least enjoyable part is using your mouse to twiddle all those teeny-weeny knobs. Dialing in just the right amount of ring modulation or trying to manually time a delay can be hell, especially if you're running the software on a laptop or using a smallish LCD display. And don't even *think* about attempting to tweak the sounds during a live performance unless you've got a hardware controller.

Kenton's Control Freak is just that—a hardware interface for your audio software. It takes away all the pain and replaces it with euphoric, hands-on joy. The Control Freak has 16 programmable knobs (which we vastly prefer to the sliders of the previous version), and eight programmable buttons (which can be doubled using a shift key), and it stores 64 custom layouts in its internal (nonvolatile) memory. You can even attach a foot pedal if you're talented enough to use your hands and feet at the same time.

Routing MIDI signals to the knobs might not be intimidating to pros, but neophytes will dig the Control Freak's awesome Learn function. In this mode, just tweak the software dial that you want to assign, and the Control Freak automatically "wires" this function to a knob or button.

Plus, in a deep-crimson steel case with a two-line backlit display, it looks great, and that never hurts.

Kenton is located in the UK, but you can find dealers on all other continents by going to the company's web site: **www.kenton.co.uk**. At $300, the Control Freak is a little pricey, but if you use software synthesizers often, especially in a live setting, it's worth every friggin' penny.

Best of the Best

As of October, 2002

Here are our current top picks for each hardware category. Red text indicates first month on chart. Check back next month for updates.

High-end videocard:
ATI Radeon 9700 Pro
Budget videocard:
Gainward GeForce4 PowerPack! Ultra/650XP Golden Sample (GeForce4 Ti4200)
Do-everything videocard:
All-In-Wonder Radeon 8500DV
Soundcard:
Sound Blaster Audigy Platinum
Hard drive:
Western Digital 1200JB
CD-RW drive:
TDK VeloCD-401248
LCD monitor:
Sharp LL-1820
CRT monitor:
Sony F520
P4 motherboard:
Asus P4T533-C/P4T533
Athlon XP motherboard:
Asus A7V333
Consumer DV camera:
Sony DCR-TRV17
Portable MP3 player:
Creative Nomad Jukebox 3
Photo printer:
Epson Stylus Photo 1280
Palm PDA:
Sony Clie PEG-N760C
Pocket PC PDA:
Compaq iPAQ 3835
5.1 speakers:
Klipsch Promedia 5.1
4.1 speakers:
Logitech Z-560
2.1 speakers:
Klipsch Promedia 2.1

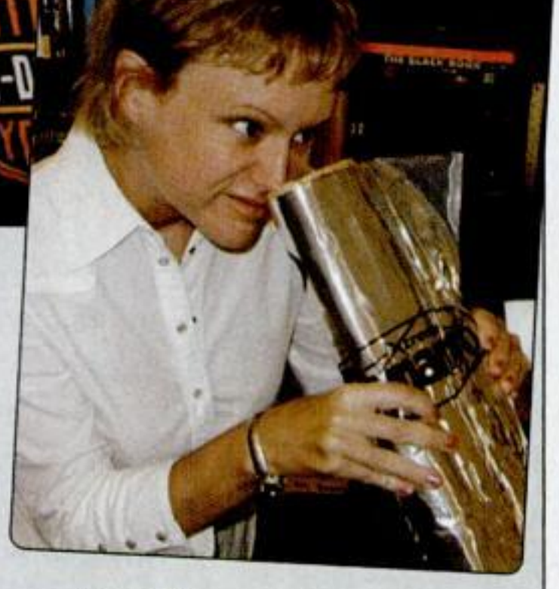
Our current gaming favorites: *Neverwinter Nights, Soldier of Fortune II: Double Helix, Warcraft III: Reign of Chaos, America's Army: Operations*

SECOND SMELL

Is Dynamat Really as Stinky as We Claimed?

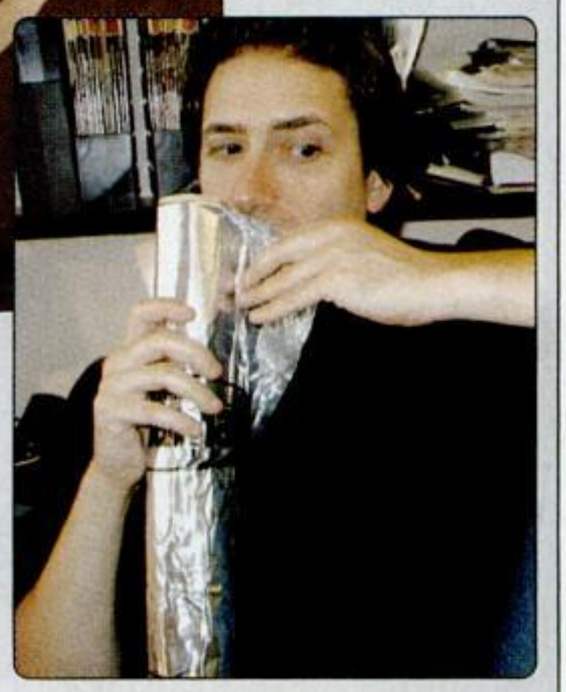
Although we've given Dynamat a "Geek Tested & Approved" award, we've also reported that the noise-dampening material can be "stinky." The company that makes the material says it used to have a funk problem with the Dynamat used for automobile applications, but says its PC material has never been rank. So we decided to give the sound-dampening material a second smell by offering up two swatches of Dynamat Extreme to various noses around the Lab.

➤ "I had a bionic nose installed, and even my +3 olfactory senses can't detect anything."
—Greg Vederman



➤ "Gordon's coffee breath smells bad at the morning staff meetings—but this stuff has no odor whatsoever."
—Natalie Jeday

➤ "It may not smell, but it tastes just like a Twix!"
—Monique Martinez



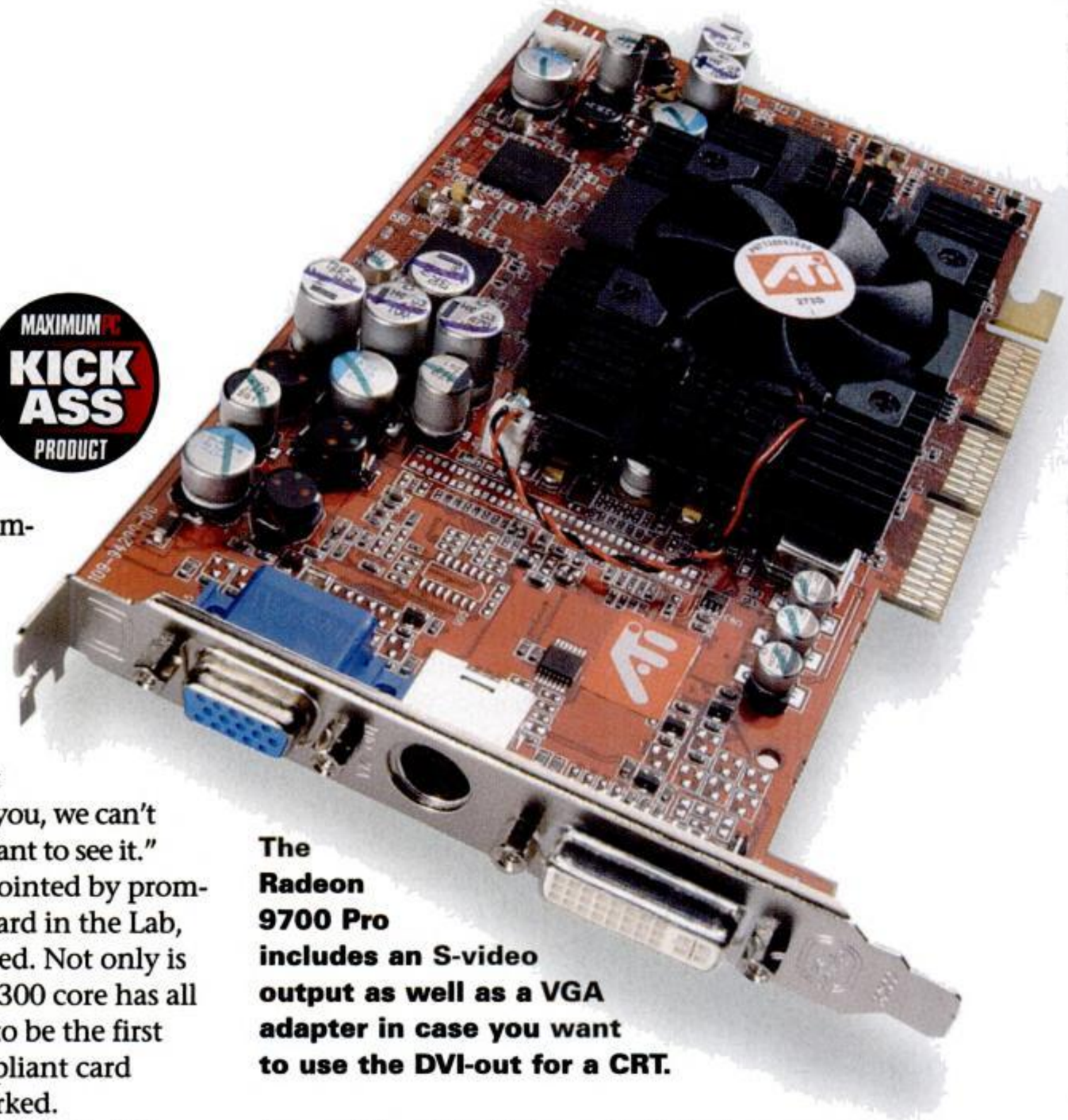
➤ "I can't smell anything. Now, that I think about it, it was probably the Lil'est Intern that stunk."
—Jon Phillips

Copyrighted material

ATI Radeon 9700 Pro

Speed, thy name is Radeon

MAXIMUM PC KICK ASS PRODUCT



The Radeon 9700 Pro includes an S-video output as well as a VGA adapter in case you want to use the DVI-out for a CRT.

Toward the end of every summer, the videocard vendors usually start hammering us with information about their new product lines. Typical communiqués include a brief overview of features, unsubstantiated performance claims, and a request for a meeting. This year, ATI called us earlier than expected, and the company's message was brief if not intriguing: "We've got something to show you, we can't tell you about it yet, but we're sure you'll want to see it."

We were skeptical. We've been disappointed by promises before. But when we finally got the card in the Lab, all of ATI's mysterious bluster was validated. Not only is the Radeon 9700 Pro extremely fast, its R300 core has all the technical chops to be the first fully DirectX 9–compliant card we've ever benchmarked. Supporting both Pixel Shader 2.0 and Vertex Shader 2.0 (key features of Microsoft's latest DirectX spec), the 9700 Pro will be able to play all the programmable shader games coming out next year, and it will run at higher frame rates than anything available today.

SPECS	
Core	R300
Core speed	325MHz
Memory	310MHz DDR SDRAM
Transistors	110 million

There are two main improvements to DX9: flexibility and precision. In respect to flexibility, the 9700 chip will afford game developers an incredibly wide breadth of coding options. For example, they'll be able to write CPU-like loop statements, which just wasn't possible with the Radeon 8500, ATI's first programmable shader card. In respect to precision, the 9700 supports 128-bit floating-point numbers throughout its entire programmable pipeline. By contrast, the Radeon 8500 (and its counterpart chips from other companies) was limited to integer calculations in some portions of its pipelines, and the floating-point accuracy that did exist was often 64-bit at best.

ATI bumped up its memory interface to 256 bits, effectively doubling the amount of data that can be transferred from the graphics processor to the onboard memory every clock cycle. The 9700 also includes a whopping eight rendering pipelines (the GeForce4 Ti and Radeon 8500 had just four each), and is able to apply 16 textures per pass. When you add all of this to the massive bandwidth available from the card's 256-bit DDR memory, you have a board that's in no way fill-rate limited.

As you can see from the benchmarks (both here and on page 38), the 9700 was tops in such landmark frame rate runs as *Quake3*, *Dungeon Siege*, and *Unreal Tournament 2003*. If you want the fastest card available today, the Radeon 9700 Pro is the only choice. But perhaps most importantly, the card provides multi-sampled anti-aliasing with only the most negligible of performance hits. In fact, the 9700 is so un-friggin-believably fast, the frame rates it clocks with AA enabled are faster than the frame rates the GeForce4 Ti 4600 achieves with AA turned off!

But surely nagging ATI driver problems should steer cautious gamers back to nVidia, right? Apparently not. It would seem that ATI's driver woes are finally a thing of the past. The company recently switched to a unified driver (a single driver executable that powers a wide-ranging product line), and most of its compatibility and speed problems have disappeared. We're even seeing new ATI driver updates every six to 10 weeks, and this means bug fixes and performance tweaks on a regular basis. Heck, we actually received a WHQL-certified driver with the 9700—a full two weeks before the cards were shipping.

How will the 9700 compare with nVidia's next-gen part, NV30? We expect to see nVidia silicon sometime before the end of the year, so we'll keep you posted. Until then, rest assured that ATI is shipping the fastest card money can buy.

—WILL SMITH

BENCHMARKS	Radeon 9700 Pro	
	No AA	2x AA
Quake3 MPC Demo	102.9 fps	103.1 fps
Jedi Outcast MPC Demo	49.8 fps	48.8 fps
3DMark Overall	11987	10985
3DMark Game2	114.1 fps	96.9 fps
3DMark Game4	66.6 fps	51.3 fps
Dungeon Siege	58.3 fps	57.4 fps
Unreal Tournament 2003	43.0 fps	38.9 fps

NOTE: All our benchmarks are run on our Pentium 4 2GHz zero-point systems. They run Windows XP Professional and have 512MB of RDRAM. For the full scoop on our benchmarks, and to see how the 9700 compares with everything else available today, check out our story on page 37.

MAXIMUM PC VERDICT

Radeon 9700 Pro
ATI

+ CHICKEN WITH RICE

The Radeon 9700 Pro is the fastest card money can buy and has a future-proof feature set.

– CHICKEN WITH BROCCOLI

Everything in your PC gets cheaper every year, except the videocard—$400 is a lotta scratch.

www.ati.com
$400
10

Copyrighted material

Pocketec Pockey 20GB External Hard Drive

Running FireWire outta town!

The amazing Pockey hard-disk jockey also comes in a 40GB model for an extra $150.

External USB 2.0 hard drives may have arrived fashionably later than their FireWire counterparts, but if you've been waiting for one, you won't be sorry. Case in point: this month's external drive from Pocketec. It grabbed all four FireWire drives we tested last month, crumpled them up, and flushed them down the john, to put it bluntly.

The 20GB Pockey external hard drive is smaller than a single foil-pack of Pop-Tarts, and at just 5.5 ounces, not much heavier than the breakfast treat. With its handsome brushed-aluminum finish, the Pockey could easily be mistaken for a dandy's cigarette case. Inside resides a 4200rpm Fujitsu notebook drive, but don't let the rotational speed spec scare you—we transferred slightly less than 1GB of large and small files in 1:10 (that's minutes:seconds, folks). The only portable FireWire drive to best this time was Maxtor's 160GB 3000XT, which is essentially a full-size, 5400rpm drive in a big, plastic box. And the FireWire Maxtor beat the USB 2.0 Pockey by just three seconds. We filled the Pockey's entire 20GB in just 23:48. After the job was finished, the drive was warm, sure, but just "stadium-handwarmer" warm, not "Fight-Club-acid-on-the-hand" warm.

Not only does the Pockey give you astonishing speed and capacity, but also the ubiquity of USB—if your host PC doesn't have a USB 2.0 connection, you can always fall back on USB 1.1. The drive is also entirely bus-powered. In the event that your USB port can't provide enough juice, you can use the clever bundled-in PS/2 adapter that gathers power from both your USB and PS/2 ports.

The 20GB Pockey is the first USB 2.0 device to actually surprise us with its performance, especially when compared with similar FireWire-based drives. It seems like the only remaining challenge is to design an external USB 2.0 hard drive that's curved like a flask, so that it rides comfortably in a back pocket.

HIGH-SPEED PORTS: The 20GB Pockey is the fastest external USB 2.0 hard drive we've ever tested, and easily beats the FireWire competition.

CONSOLE PORTS: The Pockey doesn't come with a USB 2.0 card. You'll have to have onboard USB 2.0 or a PCI card adapter to take advantage of its speed.

—LOGAN DECKER

MAXIMUM PC VERDICT: 9

$200, Pocketec, www.pocketec.net

REACH A NEW LEVEL
WITHOUT PRACTICE, LUCK, OR ULTRA-SECRET CHEAT CODES.

Thin speakers. Tight, deep bass. And a really cool control center. How can you lose?

Whether you're exploring new frontiers in gaming or grooving to your favorite songs, Monsoon's Planar Media™9 and Planar Media™7 audio systems plunge you into new depths of immersive experience. Both systems connect easily to your computer or gaming console, or your portable CD, cassette or MP3 player. Both feature Level 9™ Planar Ribbons with PFT.™ And both will elevate your entertainment options to a whole new plane.

MONSOON

Drenched In Sound

monsoonaudio.com

Copyrighted material
©2002

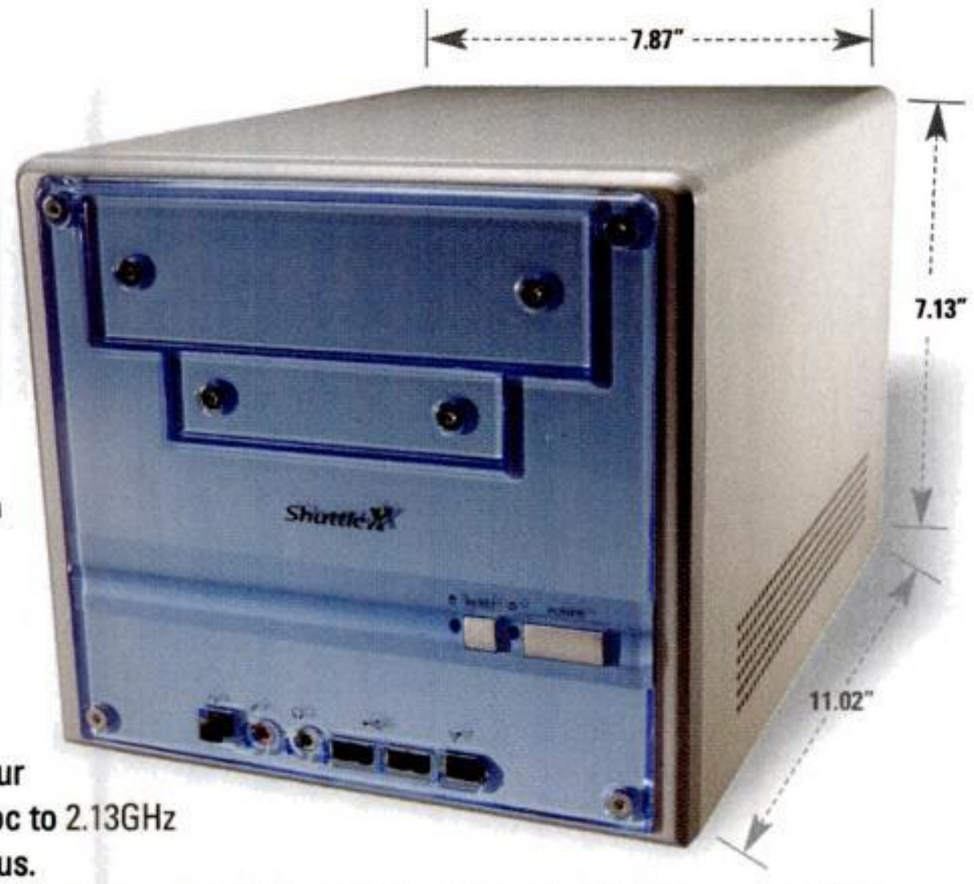
Shuttle SS51

The iMac killer is back and better than ever

We reviewed the Shuttle SS50 bare-bones mini-system in June and raved about its sleek design and small size, but slammed the lack of an AGP slot. Sporting a stylish new look, the follow-up SS51 addresses many of its predecessor's flaws *and* adds some cool new features.

For starters, the SS51 includes a 4x AGP slot, but we also applaud the addition of USB 2.0 and a 533MHz bus setting. Most of the SS50's features have carried over as well, including FireWire, Ethernet, front-mounted ports, six-channel audio, and 3D acceleration (horribly outdated), care of integrated SiS graphics. All this loot fits into the tiny SS51 thanks to the FS51 motherboard, based on the SiS 651 chipset. Past traumas have made us leery of SiS chipsets, but as with the SS50, we were pleasantly surprised by the stability. Sadly, having an AGP slot means there's room for just one PCI slot, not two.

Building a computer into such a tight space can be a daunting task. Luckily, Shuttle includes straightforward installation instructions, as well as clips and adhesive pads for securing cables. The SS51 also comes with an innovative heat pipe that eliminates the need for a dedicated CPU fan, making it a relatively silent PC. And despite the crowded case, we had no trouble overclocking our 1.6GHz P4A proc to 2.13GHz on a 533MHz bus.



Finally, a mini-system that could take the place of a tower.

Outfitted with a GeForce4 Ti 4600, 512MB of Corsair DDR333, and a 120GB Western Digital hard drive, our SS51 delivered reasonable performance. In *SYSmark2002*, for example, it lagged just three points behind a similar rig that used PC1066 RDRAM. And while the *3DMark2001 SE* score of 10852 is far from the fastest we've seen, it's by no means the slowest.

Overall, the Shuttle SS51 is a well-thought-out product. Depending on what videocard you use, it could be the basis of a versatile home entertainment system or serve as a portable gaming box for LAN parties. And given the high clutter-factor of our desks, the SS51 is the first mini-system we'd consider as a legitimate replacement for our towers.

CHEESECAKE: Small, stylish, and AGP expandable.

CUTTING THE CHEESE: The inside of the case is really crowded, and the onboard video sucks. Front-mounted volume control would be nice, too.

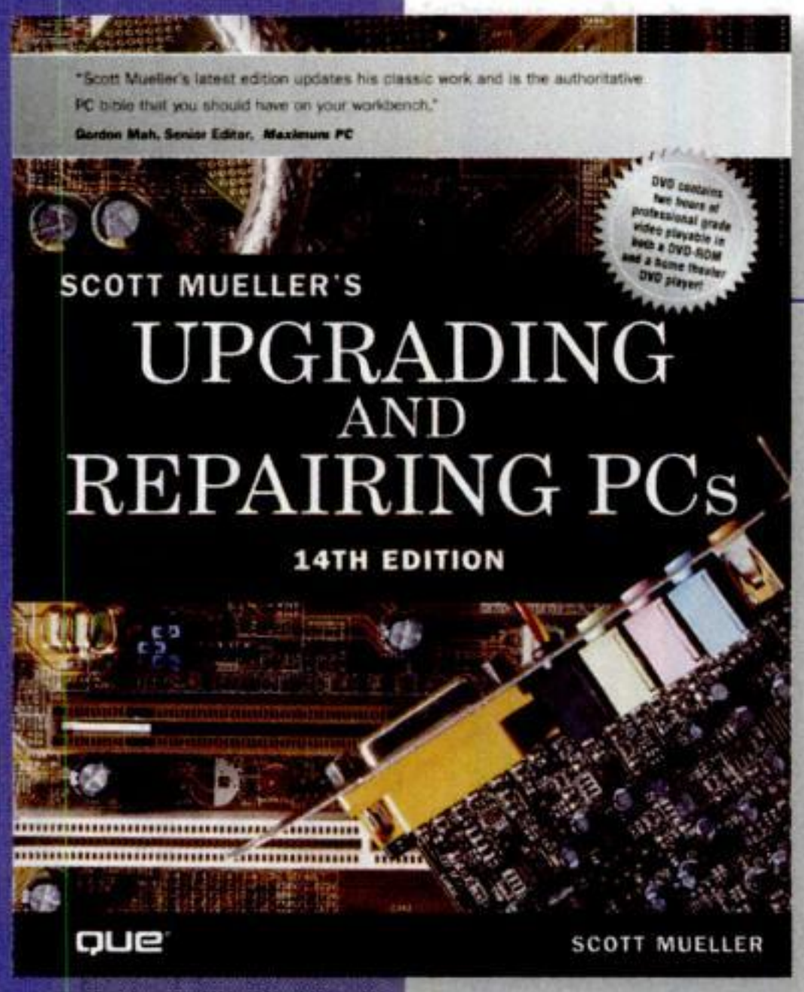
— OMEED CHANDRA

BENCHMARKS	SS51	DESKTOP ZERO-POINT
SYSmark2002	214	205
3DMark2001 SE	10852	10116
Jedi Knight II MPC Demo	54.1fps	50.3fps

NOTE: The SS51 tests were run with a 2.13GHz P4 on a 533MHz FSB with 512MB of RAM, a 120GB WD hard drive, a Lite-On CD-RW drive, and a GeForce4 Ti 4600.

MAXIMUM PC VERDICT: 9

$360, Shuttle Computer Group, www.shuttlegroup.com


"Scott Mueller's latest edition updates his classic work and is the authoritative PC bible that you should have on your workbench."
Gordon Mah, Senior Editor, Maximum PC
DVD contains two hours of professional grade video playable in both a DVD-ROM and a home theater DVD player!
SCOTT MUELLER'S
UPGRADING AND REPAIRING PCs
14TH EDITION
que
SCOTT MUELLER

Upgrading & Repairing PCs 14th Edition
$59.99
ISBN: 0-7897-2745-5

Hear Ye! Hear Ye!

The latest word of St. Scott is out:

UPGRADING AND REPAIRING PCs

14TH EDITION

Learn from the undisputed leading PC hardware teacher! Scott Mueller presents updated coverage of every significant PC component: processors, motherboards, memory, the BIOS, IDE and SCSI interfaces, drives, removable and optical storage, video and audio hardware, USB, FireWire, Internet connectivity, LANs, power supplies, and even PC cases. This book also contains a detailed troubleshooting index designed to help readers rapidly diagnose more than 250 common PC hardware problems, as well as an extensive vendor contact guide, and a comprehensive PC technical glossary.

Upgrading & Repairing PCs has sold over 2 Million Copies Worldwide.

Get your copy today at your favorite bookstore!

que®

www.upgradingandrepairingpcs.com

Copyrighted material

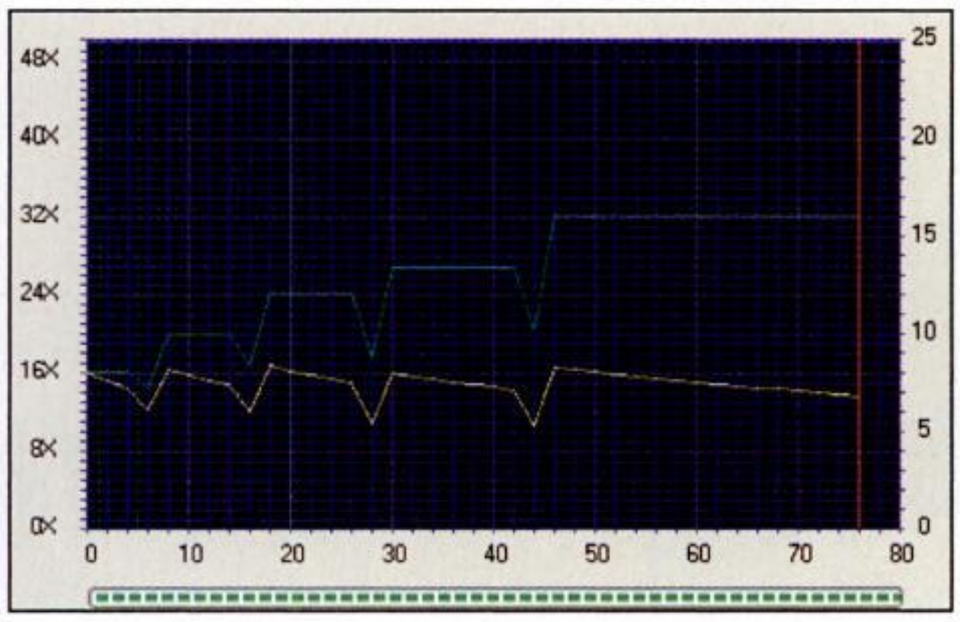
Samsung Combo 32x CD-RW & DVD-ROM

The jewel in your home entertainment crown

Samsung's SM-332 is almost completely silent during video playback *and* CD-R/W disc burning.

Maybe you've neglected to upgrade your CD burner in the last few years. Maybe you never bothered to get a DVD-ROM drive. Maybe you just don't have any drive bays left. Maybe you need to have a look at Samsung's SM-332, a combo 12x DVD-ROM and 32x CD burner. Although a cursory look at the specs might not bowl you over, Samsung's combo drive not only delivers great showings in all the different optical drive performance categories, but also offers a little surprise that pushes it to the top of the pack.

Let's go through the specs. The SM-332 reads CD-ROM at 40x, DVD-ROM at 12x, writes to CD-R at 32x and CD-RW at 10x. Although 32x CD burn-ing might seem underwhelming these days, the SM-332 takes just 3:52 (minutes:seconds) to burn a full 650MB CD using the bundled and feature-starved Standard version of *Easy CD Creator*. You *could* spring for a dedicated 48x CD-RW burner and cut that time down by 30 seconds or so—but then you'd lose the versatility of a combo drive. There's a more dramatic gap between dedicated CD-RW writers and the SM-332, however. The SM-332's best time of 8:19 to write a full CD-RW could have been cut down by as much as a minute and a half if it had been spec'd to write at 12x. And of course, 24x CD-RW is just beginning to appear in cutting-edge optical drives.



Samsung uses a five-zone Z-CLV implementation, with five distinct and progressive speed zones.

No such disappointment with digital audio extraction. The Sammy's DAE began at 15x and peaked at 36x. We ripped the contents of a 70-minutes-plus CD in just 2:41, without gaps or audible errors. Great DAE isn't usually associated with combo drives—until now.

The SM-332 merrily read data and launched video from all the recordable DVD formats we have in the Lab: DVD-R, DVD-RW, DVD+RW, and even DVD+R. This good news shouldn't be underestimated. Even if you don't want to spring for a DVD burner just yet, at least you can rest assured knowing that you can play DVD discs made by your friends. In fact, DVD-Video played smoother than a baby's butt. What we liked best about video playback, however, was something we weren't expecting. The SM-332 uses a kind of muffler that sits on top of the disc assembly and squashes the noise thrown out by the disc spin. When you're trying to watch a quiet passage in a movie, even the slightest whirr or hum from an optical drive sounds like a coffee grinder. Not so with Samsung's drive. This is *by far* the quietest drive we've ever tested.

Look at it this way: The SM-332 is a fantastic DVD-ROM drive that just happens to offer great digital audio extraction as well as CD burning speeds that aren't embarrassing. Even if you've already got a CD burner rated in the low double-digits, the SM-332 is still worth it for the virtually silent DVD playback and hauntingly low price.

—LOGAN DECKER

THE BUNDLE

Roxio *Easy CD Creator, Standard Edition* Roxio *DirectCD* CyberLink *PowerDVD XP*

BENCHMARKS	CD	DVD
Average data transfer (MB/sec)	4.5	11.08
Average drive rating	30.50x	8.0x
Random/full-stroke seek (ms)	90/164	125/215
Audio extraction (min:sec)	2:41	n/a
Data CD burn (min:sec)	3:52	n/a
CPU utilization	4% (at 8x)	19% (at 4x)

NOTE: The audio extraction test uses a commercially stamped 70:07 minute audio CD. The data-CD burn test uses the bundled applications to create a 647MB CD-R. We now use Verbatim media for all our read and write tests, unless otherwise specified.

MAXIMUM PC VERDICT

SM-332
SAMSUNG

EAGLE

You won't take much of a performance hit going with Samsung's combo drive and you'll receive the benefit of almost completely silent DVD playback.

DOUBLE-BOGEY

What's stopping combo drives from writing at the same speeds as today's dedicated 40x-plus CD burners?

www.samsungelectronics.com
$150

9

Copyrighted material

e.Digital Treo 15GB MP3 Player

The whyPod

Too bad the e.Digital chose to imprison 15GB of music and data storage in such a crappy software package.

Fifteen gigabytes is a lot of storage for your MP3s. If you need more room than that, the RIAA would like to have a word with you. So e.Digital's Treo—a 15GB hard disk–based MP3 player in a small, lightweight case—sounds pretty damn good to us. We might even forgive the slow USB 1.1 connection, given the unit's low $250 price tag. But, unfortunately, the Treo's internal OS and bundled software violates just about every tenet of the 1967 Geneva Convention on Hateful Interfaces.

For starters, you can't drag and drop through Windows Explorer. In fact, the Treo doesn't even show up as a removable storage device in Explorer. The only way to access the device is through the diabolical *Music Explorer* that's bundled in. The software looks similar to Windows Explorer, but it doesn't act anything like the interface we're used to. Get a load of the error message we got when we tried to drop a music folder into the Treo: "Unable to complete this copy operation. Only single level empty folders, empty trees, and two level trees may be copied to the root storage. Two level trees may not have files in the first level. Please change your selection and try again." Where's the flowchart that should accompany instructions like these? Why can't we store files in ways that we're used to? Why are directories limited to just two levels?

Despite a generous LCD that's 1-inch high and almost 1.75-inches wide, navigation isn't particularly easy. There are no onscreen distinctions between folders and files—no helpful icons, no font differences. It's your responsibility to remember that the first line is the root folder, the second line is the secondary, or nested, folder, and the third line is the first queued song. Whatever. Although it's possible to use the Treo to transfer any kind of file from PC to PC, we can't recommend it as a mass storage device because its directory trees are so limiting.

We really don't have many complaints about the Treo's sound, although at times it seemed thick in the midrange. We can say this, however: We've never heard an MP3 player get so loud. You have no idea. Front-row-at-Metallica loud. Put-gauze-in-your-headphones-to-soak-up-the-blood loud.

So how come the navigation and software wasn't improved to make the Treo a killer alternative to high-end players? We can only wonder why.

⊕ **THE FANTASTIC FOUR:** It's cheap, and if you could hack the right driver, the Treo might become a decent, low-rent, hard disk–based MP3 player.

⊖ **THE THREE AMIGOS**: "Unable to complete this copy operation. Only single level empty folders, empty trees, and two level trees…."

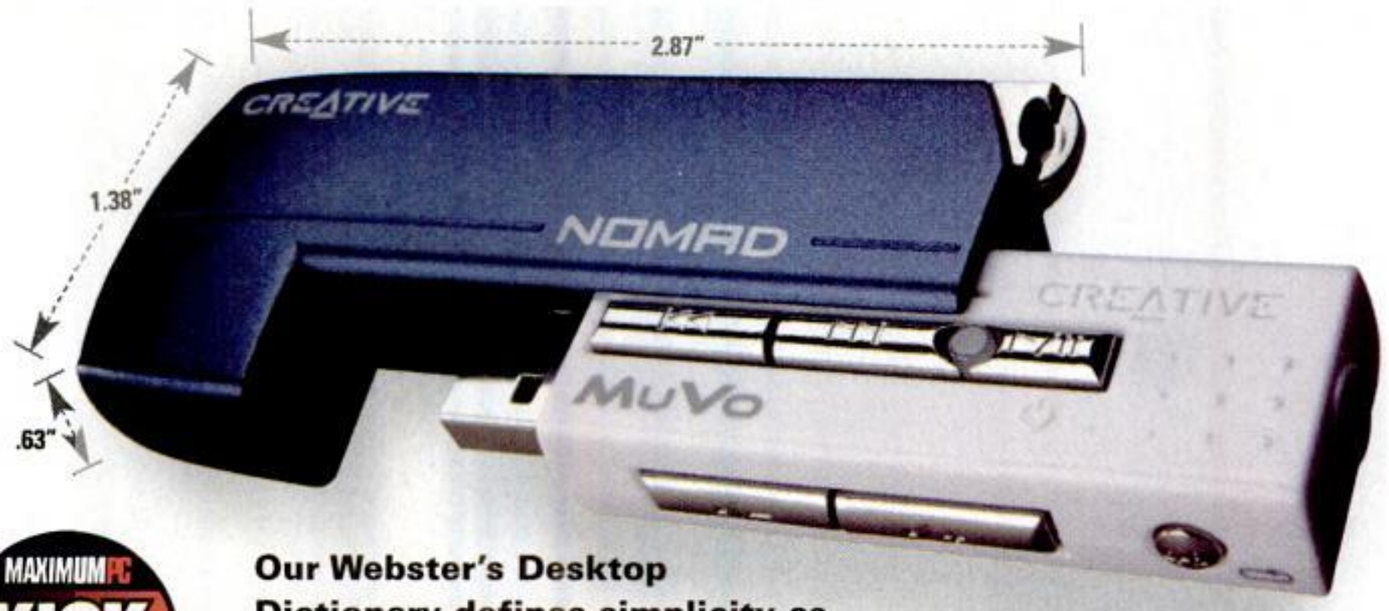
—LOGAN DECKER

MAXIMUM PC VERDICT: 5

$250, e.Digital, www.edigital-store.com

Creative Labs 128MB Nomad MuVo

MuVo puts the groov-o in a USB key



MAXIMUM PC KICK ASS PRODUCT

Our Webster's Desktop Dictionary defines simplicity as "freedom from intricacy or complexity." That's the Nomad MuVo for you. You know you want it.

Flash memory keys: Did we mention how much we love these things? You just plug one into a USB port, and it shows up in Windows Explorer as a removable drive. As long as you have WinME or a newer OS, you don't even need drivers. You just drag and drop your files into the key, yank it out, then take it to another PC. We haven't touched floppy discs since these little wonders arrived on the scene.

Creative Labs' version of the USB key takes the concept a huge step further. Plug the 128MB nubbin into its tiny battery pack, and faster than you can say "cross-dresser," you've got an MP3 player! (At this point we can hear Elaine saying "get out!" as she shoves us backwards with both hands.)

The Nomad MuVo will play any MP3s you have in the root directory of the key. We played MP3 files encoded at rates between 8kbps (slightly better than the sound quality of an electronic greeting card) and 320kbps. The MuVo didn't choke on variable bit rate files, either: It played tracks that went from the 51 percent quality setting all the way up to 100 percent. WMA playback ranged from a standard 64kbps to a ridiculous 192kbps. The MuVo won't play WAV files, though. Not that you could fit many on a 128MB chip anyhow.

With no display readout other than a single LED, the device doesn't report any song information whatsoever—so you better remember the order in which your songs were loaded. If you want ID3 tag searching, lyric display, video messaging, and biometric security, this isn't your MP3 player. But, again, as long as you're running WinME or above, the MuVo doesn't require any software to work. None. *Nada*. The MP3 decoder is nestled comfortably in the unit's tiny onboard controller. Surprisingly, no MP3 encoding software is included—not even Creative's own ubiquitous *Playcenter*. Odd.

Sound quality was fantastic (unexpected from such a small player), and the device requires just a single AAA battery. This isn't the kind of power-user gizmo we usually freak out over. Instead, it gets a Kick-Ass Award for its ingenuity and utter simplicity. Besides, what's sexier than a two-piece?

⊕ **BONUS TRACKS:** The Nomad MuVo combines removable storage and great-sounding MP3 playback in an idiot-proof package. It couldn't be any easier to use, unless someone was using it for you.

⊖ **LAUGH TRACKS**: If you're using Win98, you'll have to install drivers included on the CD (no big deal). The memory isn't expandable with removable media.

—LOGAN DECKER

MAXIMUM PC VERDICT: 9

$130, Creative Labs, www.nomadworld.com

Copyrighted material

COMPONENTS

Abit KX7333 with AMD Athlon XP 1800+*	$215
Abit BD7II-533 with Pentium®-4 2.26GHz	$385
Asus P4T533-C with Pentium®-4 2.26GHz	$435
Asus P4B533-E with Pentium®-4 1.6GHz	$435
Asus A7V333 with AMD Athlon XP 1800+*	$229
Asus A7S333 with AMD Athlon XP 2200+***	$298
Gigabyte GA-7VRXP with AMD Athlon XP 1800+*	$227
Gigabyte GA-7VRX withAMD Athlon XP 2200+***	$305
Gigabyte GA-8IGX with Pentium®-4 2.26GHz	$389
Gigabyte GA-8IEXP with Pentium®-4 1.6GHz	$289
Gigabyte GA-8IHXP with Pentium®-4 2.4GHz	$589
Soyo KT333 Dragon UI w/AMD Athlin XP 2200+***	$389
Soyo KT333 Dragon w/AMD Athlon XP 1800+*	$215
Soyo P4S 645DX with Pentium®-4 1.6GHz	$309

MOTHERBOARDS

Gigabyte 7DPXDW with AMDAthlon MP2100+

40GB 7200rpm Western Digital WD400BB	$72
80GB 7200rpm Western Digital 8MB Cache	$119
1200B 7200rpm Western Digital 8MB Cache	$189
40GB 7200rpm ATA/133 Maxtor D740X	$72
80GB 7200rpm ATA/133 Maxtor D740X	$105
1600GB 7200rpm ATA/133 Maxtor D740X	$239
40GB 7200rpm IBM 120GXP	$69
80GB 7200rpm IBM 120GXP	$89
120GB 7200rpm IBM 120GXP	$139

HARD DRIVES

IBM, 40GB, 7200rpm ATA/100

CDRW 24x10x40 TDK VeloCD IDE/ATAPI	$59
CDRW 48x16x48 TDK VeloCD IDE/ATAPI	$99
CDRW 24x10x40 TDK VeloCD External USB	$169
CDRW 24x10x40 TDK VeloCD External FireWire	$169
CDRW 40x12x48 LITE-ON, Beige Color, IDE	$69
CDRW 40x12x48 LITE-ON, Black Color, IDE	$79
DVD, Lite-on, 16x Black Color	$49
CDRW/DVD 20x10x40x12 Plextor, Beige/Black, IDE	$199
CDRW 40x10x40 Plextor, Beige/Black, IDE	$149
CDRW 12x10x32 Plextor, SCSI	$189
DVD-RW Pioneer AO4	$329
DVD-RW HP 200XI	$459

OPTICAL DRIVES

CDR W 48x16x48 TDK VeloCD

Video,32MB ATI Rage-128, AGP/PCI	$35/45
Video,64MB ATI Radeon-7000.PCI	$69
Video,64MB ATI Radeon-7500. AGP	$89
Video,64MB ATI Radeon-8500LE, AGP	$129
Video,64MB Radeon-8500 All-in-Wonder, AGP	$129
Video,32MB Visiontek GeForce2-MX420, AGP	$89
Video,128MB Visiontek GeForce4-TI4200, AGP	$219
Video,128MB Visiontek GeForce4-TI4600, AGP	$379
Video,64MB PNY GeForce4-TI4200,AGP	$169
Video,128MB PNY GeForce4-TI4600,AGP	$319
Video,128MB PNY Quadro4 750XGL, AGP	$599
SB Live! 5.1 Digital Sound Card	$35
SB Live! Audigy Digital Sound Card	$65
SB Live! Audigy Platinum	$169
Turtle Beach Santa Cruz Digital Sound Card	$65

VIDEO AND SOUND

Matrox Perhelia 128MB, AGP

Compucase CI-6919B Fire Wire/USB, 300W	$79
Enermax 710/710B/710BB 350W	$99
Enermax CS-5190 Silver/Red/Black Color	$389
Inwin IW-L545, USB2.0. 180W Flex ATX	$49
Inwin J508, USB2.0, 300W	$79
Inwin J523, USB2.0, 300W	$79
Inwin Q2000, 400W	$149
Enermax 350/550W Power Supply	$55/145
HEC 350W Dual Fan Power Supply	$39
RaidMax 500W Aluminum Power Supply	$69

CASES & POWER SUPPLIES

Adamant A201B Aluminum case w/3 Windows & 4 Fans

15" XGA LCD Cornea MP-503, .29DP	$339
15" XGA LCD Cornea CT-1503, .29DP	$499
17" XGA LCD Cornea MP-704, .26DP	$549
17" XGA LCD/TV Cornea CT-1702, .26DP	$699
15" XGA LCD Scanport GL-166S, .29DP	$339
17" XGA LCD Scanport GL-82IA, .26DP	$539
18" XGA LCD Scanport GL-180TUA, .26DP	$639
19" XGA LCD Scanport GL-192OA, .29DP	$949
15" XGA LCD CTX PV520, .29DP	$349
17" XGA LCD CTX PV720, .26DP	$539
19" XGA LCD CTX SV900MD, DVI	$999
19" XGA LCD CTX PV910MD, DVI	$1699
42" XGA Plasma Display Cornea	$4199

MONITORS

CTX 17" PV720 LCD Monitor

ADAMANT SYSTEMS

BARGAIN GAMER AS LOW AS $889

- AMD Athlon™ XP 1800+ Processor with QuantiSpeed architecture*
- Gigabyte 7VRX 333MHz FSB Motherboard
- 256MB PC2700 Micron DDR Memory
- 80GB, 7200RPM, 8MB Cache Hard Drive
- 24x10x40 TDK VeloCD CD-RW Drive
- 64MB 4x AGP Nvidia GeForce4 MX440Video
- 56K V.92 Zoom PCI Modem
- Turtle Beach Santa Cruz Digital Sound Card
- 10/100 PCI Fast Ethernet Card
- Inspire-5300 Digital Speakers w/Subwoofer
- Enhanced Keyboard and Mouse
- Microsoft Windows ME or 98SE
- Free Upgrade to Windows-XP Home Edition
- Free Software: PC Works Suite-2002 Includes: Word Processor,Spreadsheet, Event Planner, Database, Presentations and more...
- 3 Years Parts, Lifetime Labor Warranty
- (Gold and Black Color Cases available)

Upgrade to 80GB Mirrored RAID Storage ..... only $129

AMD Athlon™XP 1800+	$889
AMD Athlon™XP 2000+	$939
AMD Athlon™XP 2200+	$1019

GAMERS DREAM AS LOW AS $2069

- AMD Athlon™XP 2000+ Processor with QuantiSpeed architecture**
- Soyo KT333 Dragon Ultra Motherboard
- 512MB PC2700 DDR Memory
- 120GB 7200RPM, 8MB Cache Hard Drive
- 16x Max DVD-ROM Drive
- 40x12x48 TDK VeloCD CD-RW Drive
- 128MB 4x AGP Nvidia GeForce4 T14600
- 56K V.92 Zoom PCI Modem
- 10/100 PCI Fast Ethernet Lan Card
- Digital 6 CH Sound Card w/OpticalConnector
- Klipsch 5.1 Digital Speakers w/Subwoofer
- Aluminum Case w/500W Dual Fan PS, temperature LCD Panel and Fan Speed
- Adjusting Knobs
- Enhanced Keyboard and Mouse
- Microsoft Windows ME or 98SE
- Free Upgrade to Windows-XP Home Edition
- 3 Years Parts, Lifetime Labor Warranty
- (Silver and Black Color Cases available)

Free Upgrade to Logitech Freedom Cordless Keyboard and Optical cordless mouse

AMD Athlon™ XP 2000+	$2069
AMD Athlon™ XP 2100+	$2099
AMD Athlon™ XP 2200+	$2139

SMALL BUSINESS AS LOW AS $999

- 1.8GHz Pentium®-4 512K Processor
- Gigabyte 533MHz FSB Motherboard
- 256MB Shared PC2100 DDR Memory
- 40GB 7200RPM UIDE Hard Drive
- 40x12x40 CD-RW Drive
- 64MB Integrated S3 3D AGP Graphics
- 56K V.92 Zoom PCI Modem
- 64bit AC97 3D Sound Card
- 10/100 PCI Fast Ethernet Lan Card
- Multimedia PC Stereo Speakers
- 15"XGA LCD Flat Screen Display
- Enhanced Keyboard and Wheel Mouse
- Microsoft Windows ME or 98SE
- Free Upgrade to Windows-XP Home Edition
- Free Software: PC Works Suite-2002 Includes: Word Processor, Spreadsheet, Event Planner, Database, Presentations and more...
- 3 Years Parts, Lifetime Labor Warranty
- (White and Blue Color Cases available)

Pentium®-4 1.6GHz	$979
Pentium®-4 1.8GHz	$999
Pentium®-4 2.0GHz	$1029

PERFORMANCE STATION AS LOW AS $2479

- 2.26GHz Pentium®-4 533MHz Bus Processor
- Intel® 533MHz FSB Motherboard
- 256MB PC800 RDRAM Memory
- 80GB 7200RPM 8MB Cache Hard Drive
- 40x12x40x CD-RW Drive
- 16x Max DVD-ROM Drive
- 128MB GeForce4 TI4600 AGP Graphics
- Sound Blaster Audigy Sound Card
- 56K V.92 Zoom PCI Modem
- 10/100 PCI Fast Ethernet Lan Card
- Alec Lansing-251 Digital Speakers w/Subwoofer
- 19" XGA LCD Flat Screen Display
- Enhanced Keyboard and Wheel Mouse
- Microsoft Windows ME or 98SE
- Free Upgrade to Windows-XP Home Edition
- 3 Years Parts, Lifetime Labor Warranty
- (White and Blue Color Cases available)

Pentium®-4 2.26GHz	$2479
Pentium®-4 2.4GHz	$2635
Pentium®-4 2.5GHz	$2859

Prices and configurations are subject to change without notice or abligation. Not responsible for typographical errors. Valid RMA number required for all returns. Shipping, charges are not refundable and are deducted from price. No refunds will be made for merchandise returned after 30 days from the date of the invoice. Purchaser is responsible for all freight costs on all returns of merchandise. Full credit will not be given for incomplete or damaged returns. Products returned in non-refundable conditions are subject to a restocking fee. Call for warranty and return policy details. All logos and trademarks belong to their respective companies. Windows is a registered trademark of Microsoft Corporation.
*AMD Athlon XP 1800+QuantiSpeed architecture operates at 1533MHz. **AMD Athlon XP 2000+QuantiSpeed architecture operates at 1.67GHz.
***AMD Athlon XP 2200+QuantiSpeed architecture operates at 1800MHz.

ADAMANT COMPUTERS
800-284-2257

Microsoft OEM System Builder Gold Member 2002

Quality systems from Adamant Computers are powered by AMD

CALL FOR PRICING ON YOUR CUSTOM CONFIGURATIONS

ADAMANT COMPUTERS, INC., 4572 RENAISSANCE PKWY, CLEVELAND, OH 44128 PHONE: 216-595-1211, TECHNICAL SUPPORT: 216-595-9985, FAX: 216-595-1430

Copyrighted material

Lego Spybotics

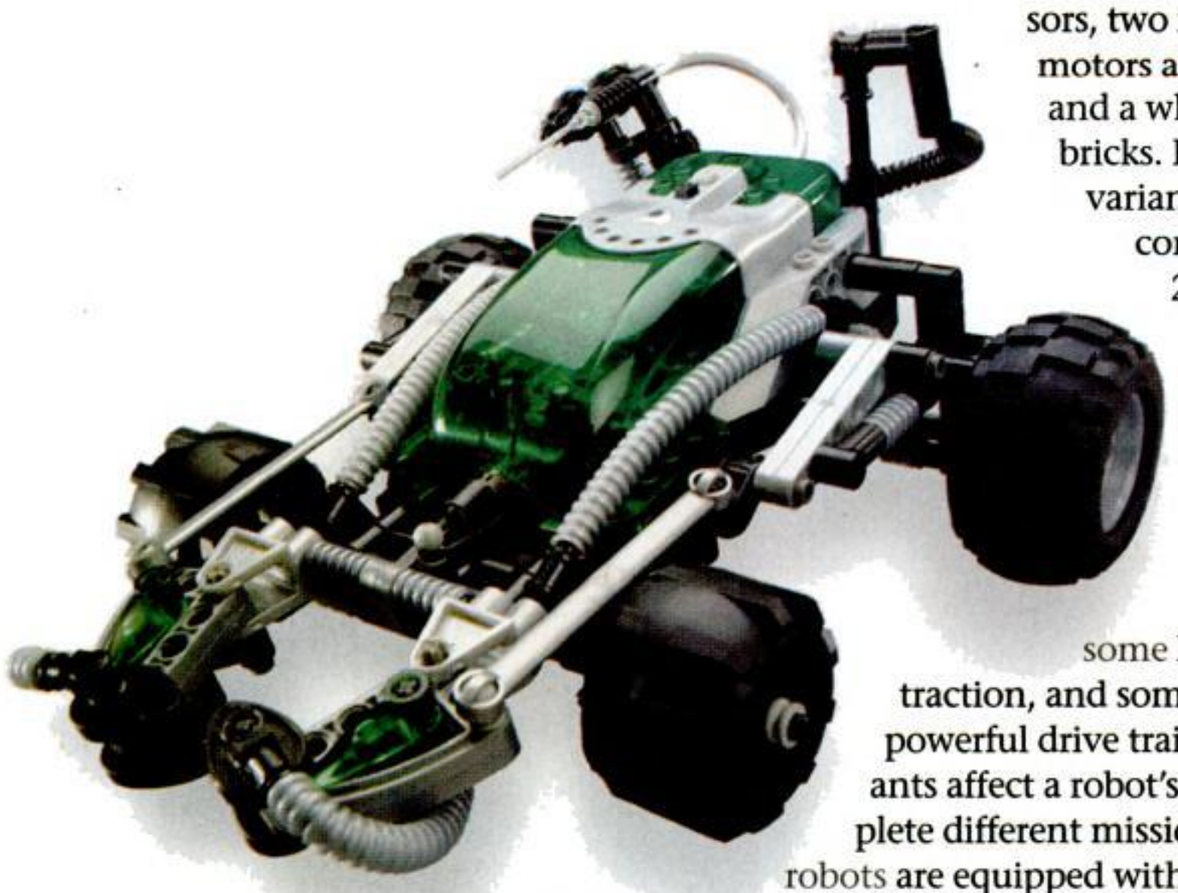
Sort of like Mindstorms, but without all the crying

Being shocked just right can make you wet your pants. Don't worry, the engaging Spybotics mission briefings are only make-believe.

The Spybotics series was designed as a stepping-stone between classic Lego theme sets (think pirate, astronaut, and cowboy collections) and the intellectually deep but mind-bogglingly difficult Mindstorms. Lest you forget, the Mindstorm kits entailed complex robot building and programming—tasks that left little kids crying, and even PC-savvy adults asking what the hell they got themselves into. The Spybotics series ends the frustration with a refreshingly simple concept: Build robot, steer robot, earn points.

Well, it's not quite *that* simple. First, you build a Spybotics robot thingamabob, attach it to your PC, and then open up a "mission" from the bundled software. The mission includes briefings and instructions for setting up living room obstacle courses for your Spybot to navigate. Next, you place the robot on the floor and use a remote control to guide it through the course. The quicker you finish mission objectives, the more points you collect. Simple.

Four Spybotics sets are currently available, and each set includes mission software, a serial cable, a remote control, a smart block with sensors, two independent motors and sensors, and a whole lot of bricks. Each Spybot variant (the most complex includes 244 separate pieces) comes with its own strengths and weaknesses. Some are quicker, some have better traction, and some have more powerful drive trains. These variants affect a robot's ability to complete different missions. All the robots are equipped with touch sensors—so if you touch an obstacle during a mission, it might begin to spasm and veer off course (hence the game's challenge).



Technojaw! Cower in its midst!

The Spybotics series is quality stuff, but we still have our gripes. Every Lego experience begins with construction, and construction requires instructions. The rub is that all Spybot instructions are software-based. You can rotate and zoom in on parts—nice features that add clarity to the building process—but there's no way you could ever build your Spybot away from your PC. This annoyance detracts from the essential Lego experience. Once you're finished, you can move your unit forward, backward, left, and right, but we were peeved to find that our "Technojaw" robot's claws lack independent control; they only open and close when you move the Spybot forward or back.

Software is where the Spybotics kit shines. It would be an understatement to call Spybotic missions "themed," as there's some *serious* role-playing going on here. Mission briefings are incredibly entertaining. For example, a 3D-animated movie of a space propulsion lab under duress made even our jaded staff feel like the fate of the free world rested in its hands. Great script-writing and voice-overs (complete with snooty British accents) didn't hurt either.

While the fantastic mission briefings had us dreaming of Bond girls, playing the missions themselves was a bit of a letdown. We just couldn't believe that our Spybot's "mission environment" was a nuclear power plant going critical, and not just a bunch of old PC components arranged as an obstacle course on the floor. Be realistic, Lego: Unlike Mindstorms, not many kids entering puberty are going to play with their Spybots for very long, so maybe an age cap is in order (the kits are rated for "9+").

Spybotics biggest flaw is that the series doesn't lend itself to old-time Lego tinkering. When we were kids, we could take a pirate schooner kit and a space station kit, throw the parts in a bucket, shake 'em up, and arrive at a space-jamming cruiser flying the Jolly Roger. But Spybotics is almost completely inflexible to construction deviations, and the included software is only useful for the intended model. Unfortunate, because Legos have always been great toys for creative building, and not just playing.

—BRIAN LAM

MAXIMUMPC VERDICT

Spybotics
LEGO

+ A WHEEL
Robotics for cheap. Great software.

– A REGULAR WHITE BLOCK
Inflexible building options. Of limited interest to anyone younger than nine and older than 11.

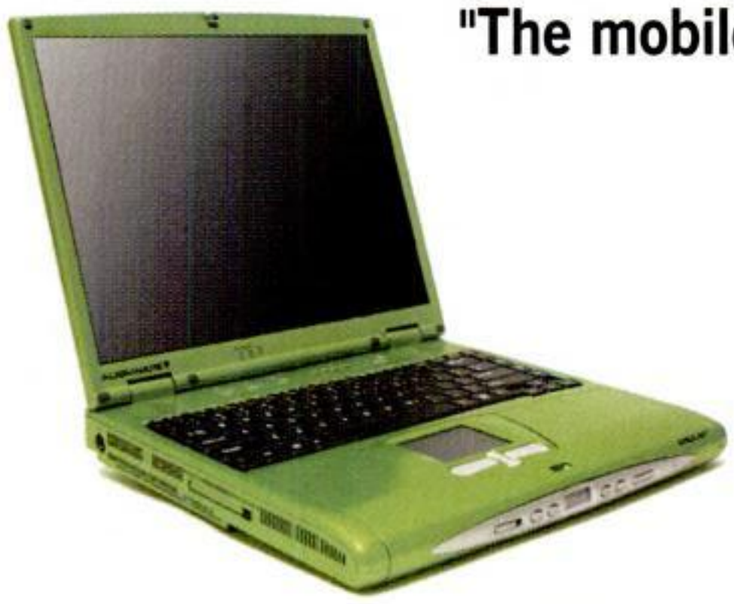
www.lego.com
$60 (per bot)

7

Copyrighted material

THE INVASION HAS BEGUN

Maximum PC, ALIENWARE®, and Electronic Arts™ are giving away one Area-51m™ Ultimate Mobile Gaming Machine™ and 1,000 copies of Medal of Honor: Allied Assault™



"The mobile Alienware is the fastest notebook we've ever tested."
- Maximum PC

MAXIMUM PC KICK ASS PRODUCT

Enter to Win an Alienware® Area-51m™!

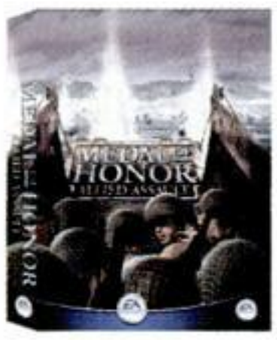
The Area-51m™ represents the first fully capable mobile gaming solution. The performance requirements of today's most cutting edge games have been simply too demanding for a laptop unit, until now. The Area-51m™ plays games at blistering speeds, handles quick motion with incredible accuracy, and performs phenomenally high in benchmarks. Perfect for LAN parties and for those who simply cannot part from their desktop system's performance, the Area-51m™ is the ultimate mobile gaming machine.

AREA-51m™ MOBILE GAMING

- Intel® Pentium® 4 Processor at 2.4GHz and 512KB Advanced Transfer Cache
- High-Performance Heatsink/Cooling with Arctic Silver III
- Intel® 845MP+ ICH3M Chipset Motherboard
- 512MB DDR SDRAM (PC-2100)
- Exclusive Metallic Cyborg Green Laptop Chassis
- 40GB ATA100 Hard Drive
- 15.0" UltraXGA+ TFT Active Matrix LCD
- ATI® Mobility RADEON™ 7500 64MB DDR with Dual-View Display Monitor and TV-out
- Removable 3.5" Floppy Drive
- Removable 8X/8X/24X DVD-ROM/CD-RW Combo Drive
- Sound Blaster® Compatible with Wavetable
- 5.1 3D Surround Sound with S/PDIF Digital Output
- Front Panel Audio DJ CD Player
- Allows CD Play While System is On or Off
- One Type II PCMCIA Slot
- Four USB Ports and One IEEE 1394 Port
- Infrared Wireless Fast IR Interface
- Internal 10/100Mb Ethernet LAN and 56K Modem
- Dimensions: (H) x (W) x (D) : 1.7" x 13" x 11.4"
- Weight: 7.6lbs. without battery
- Exclusive 120-Watt A/C Adapter
- Microsoft® Windows® XP Professional
- 1-Year Toll-Free 24/7 Technical Support
- AlienAutopsy: Automated Technical Support
- Personalized Owner's Manual
- Exclusive Alienware® T-Shirt
- Custom Alienware® Mouse Pad
- Optimized & Configured for High-Performance

Win One of 1,000 Copies of

MEDAL OF HONOR: Allied Assault™



Set during the most trying years of the war, from 1942 to 1945, Medal of Honor: Allied Assault gives you a sense of the courage it took to survive the landings at Normandy, the assault at Arzew, a rendezvous with the French Resistance outside the village of St. Lo and the push through the heavily defended border of Germany itself to take the bridge at Remagen.

PLAYS BEST ON ALIENWARE®

Custom Build your Dream Machine at **WWW.ALIENWARE.COM**
For More Information Call Toll-Free: 800.494.3382

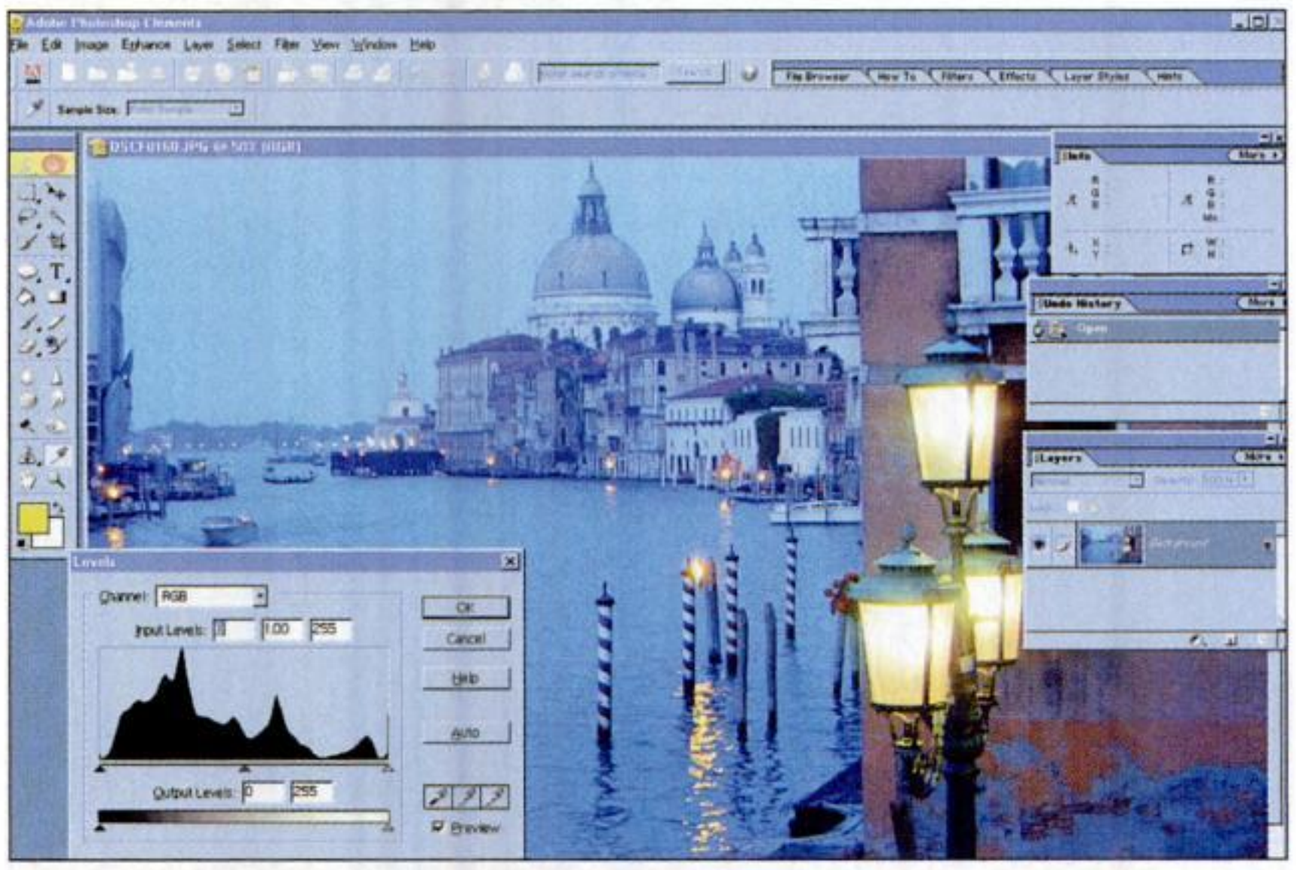
Contest ends October 31, 2002. No Purchase Necessary. Void where prohibited. A copy of the Official Rules are available at www.alienware.com/maxpc.

Alienware® recommends Microsoft® Windows® XP Professional for Mobile Computing.

Copyrighted material

Adobe Photoshop Elements 2.0

90 percent of *Photoshop* for 10 percent the price



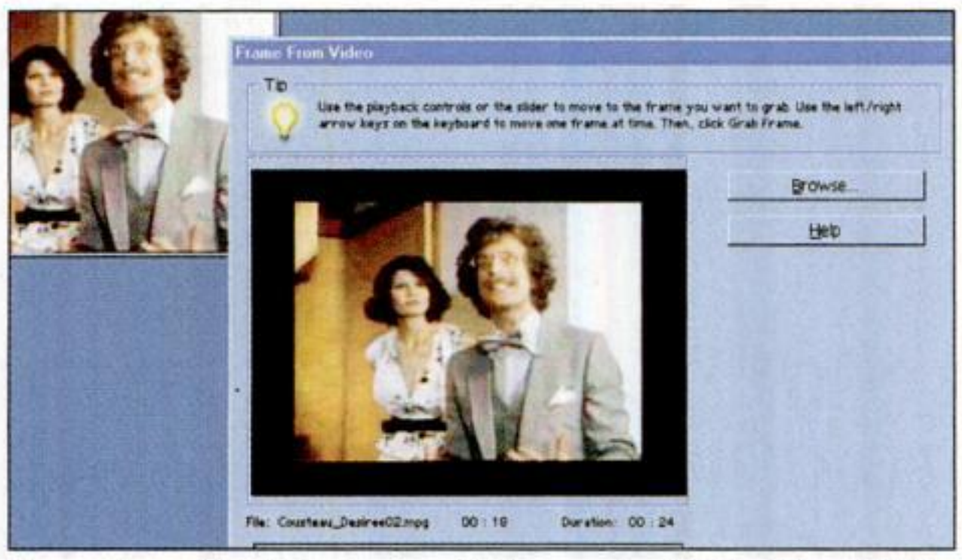
Looking at *Elements 2.0*, you'd swear you were in the latest rev of *Photoshop*, but a glance into your wallet would convince you otherwise.

Let's start with what we know. *Photoshop*, Adobe's flagship image editor, is the best application software ever written. Bar none. But *PhotoDeluxe*, Adobe's entry-level image editing software, was an underpowered, over-interfaced joke. So it's dead.

Enter *Photoshop Elements 2.0*.

This time Adobe did it right, creating an image editor with nearly all the power of its proud papa, but with newbie-friendly controls and a price tag that anyone can stomach.

Upon launching *Elements 2.0*, you may initially think you're in *Photoshop 7*. The interface is incredibly similar, replete with the expanded menu bar across the top of the uncluttered work area, nested palettes docked in the top right of the screen, and the familiar Adobe toolbar floating to the left. No more insulting oversized buttons chewing up valuable real-estate. A look into the toolbar reveals many of our familiar favorites: the clone tool, dodge and burn brushes, and the gradient tool. Even relatively new features such as the magnetic lasso and the sharpen brush are present and accounted for. A handy red-eye brush is nestled among the standard array.


Frame From Video
Tip
Use the playback controls or the slider to move to the frame you want to grab. Use the left/right arrow keys on the keyboard to move one frame at time. Then, click Grab Frame.
Browse...
Help
File: Courteau_Desiree02.mpg
00 : 10
Duration: 00 : 24

An unheralded feature of *Elements 2.0* is the ability to easily grab frames from digital video with the click of a button.

***Elements 2.0's* web optimization tools lets you take this 700K devil down to a meager 49K.**

But the progenitor app's steep learning curve has been leveled with a few key additions. The Hints palette is a well-implemented help guide that should ease anyone into *Elements'* world of image editing. The How-To palette is a surprisingly robust step-by-step guide that might teach even Asia Carrera a few new tricks. There's a 12-step guide to making coloring books out of your pictures, guides for hand-tinting B&W photos, and tips for tweaking text.

Elements 2.0 is also surprisingly web savvy (funny, considering that Adobe still hasn't integrated *Photoshop* and *ImageReady*, its pro web graphics tool). In addition to including *Photoshop's* web image optimization tools, *Elements 2.0* includes support for GIF animations and button effects such as bevels and glows. There's even a tool that builds custom HTML web galleries for easy posting online.

Want to ditch your third-party image browser? *Elements 2.0* comes with the same hearty file browser that now graces *Photoshop*. This tool can be nested in the palette dock at the top right of the screen, and can perform many common chores such as batch rotation and renaming files. There's even support for EXIF data that many digital cameras use to embed exposure information. While we aren't ready to sacrifice the speed of *ACDSee* or the depth of cataloguing software like *Smart Pix Manager*, this is an indispensable addition to *Elements*.

So what's missing? Well, *Photoshop's* support for professional pre-press is absent, as is *Version 7's* vaunted "healing" brush. And *Photoshop* vets who habitually hit Ctrl-M will be disappointed when the Curves dialogue fails to spring up. Adobe felt Curves were too complex for the target audience, but thankfully the Levels feature is still in the house.

We find it astonishing that *Elements 2.0* delivers so much of *Photoshop's* muscle for a fraction of the price. The software lists for $100, in contrast to *Photoshop's* $600-plus. Seriously: Unless you're a professional content creator, *Elements 2.0* is by far the more sensible purchase.

—BRAD DOSLAND

MAXIMUM PC VERDICT

Photoshop Elements 2.0
ADOBE

+ 1280X1024
New integrated utilities and classic *Photoshop* power combine to create amazing bang for the buck.

– 640x480
We miss the Curves control.

www.adobe.com
$100 ($30 competitive rebate/upgrade)

10

Copyrighted material

Intel® Pentium® 4 Processor - 2.40 GHz
Viewsonic 19" P90F .24dp Monitor
512MB PC2100 DDR Memory
120GB 7200RPM EIDE Hard Drive
NVIDIA GeForce4 Ti4600 128MB AGP
SoundBlaster Audigy Platinum
Logitech Z-560 4.1 Speakers w/sub
56K V.90 Modem, 10/100 NIC
40x12x48 Black CD-ReWritable Drive
16x48 Black DVD-ROM
KWI KT-436 Aluminum w/windows
350W Power Supply
Choice of Light Kit installed

The Epic Pack

$2349.99

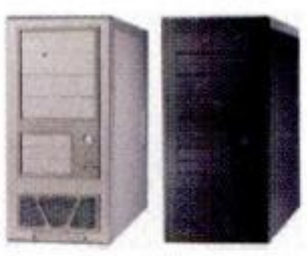
Intel® Pentium® 4 Processor - 1.80 GHz
MPC 15" Flat Panel LCD
256MB PC133 SDRAM Memory
60GB 7200RPM EIDE Hard Drive
NVIDIA GeForce4 Ti4200 64MB AGP
16-Bit 3D Stereo Sound
Logitech Z-340 Speakers w/sub
10/100 NIC
40x12x48 Black CD-ReWritable Drive

THE ASSAULT PACK

$1599.99

LIAN LI

starting from $100



SKY HAWK

starting from $65

KWI KINGWIN

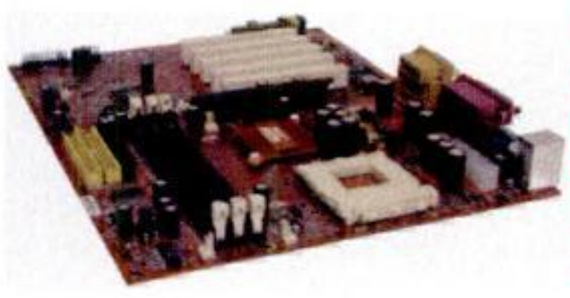
starting from $160

Chieftec

starting from $65

CASE MODS

Window Kits *from $10*
Window Side Panels *from $25*
Cold Cathode Lights *from $25*
Flexible EL Cable *from $30*
Rounded Cables *from $4*
Quieting Kits *from $75*
Digital Doc 5 *from $35*
...and more!



MSI KT3 Ultra *$80*
ASUS A7V333 *$117*
MSI 845E Max *$94*
GIGABYTE GA-7VRXP *$107*
GIGABYTE GA-8IEXP *$138*
AOPEN AK77-333 *$80*

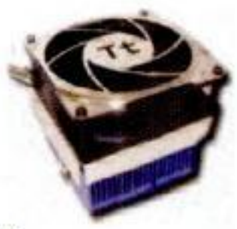
starting from $50

starting from $100

COOLING

Offering cooling solutions by:

COOLER · Speeze · ThermalTake · Enermax · Dynatron · VANTEC



Case Fans *from $6*
Heatsinks w/fan *from $7*
VGA Chipset Cooler *from $8*
Memory Cooling *from $8*

starting from $318

Come and check out our great prices on processors

AMD Athlon XP PROCESSOR

intel inside pentium 4

MPC Parts.com

www.mpcparts.com

(800) 331-3323

3900 N. Sherburn Place
Shorewood, WI 53211

Your SOURCE for computer parts online!

Prices and configurations subject to change without notice. Pictures for illustration purposes only, actual items may vary in appearance.

Copyrighted material

HardDrive.com

Your GAMING Resource

We are the largest source for black components

We stock thousands of Computer Products

Plextor 20x10x40 & 12X DVD Combo
$175
PlexCombo Record CD's or watch DVD's

Iwill P4R533N Socket 478 Mobo
$139
Supports up to 2GB PC1066 533 MHz Bus Onboard Nic

Pacific Digital DVD Burner
$289
1x DVD-R
2x DVD-RAM
U30116

Sales Line: 800-400-3499

IDE Hard Drives

MAXTOR				
20GB	5400rpm	2B020H1	★	$69
20GB	7200rpm	6L020J1		$75
40GB	5400rpm	4D040H2		$76
40GB	7200rpm	6L040J2		$83
60GB	5400rpm	4D060H3		$96
60GB	7200rpm	6L060J3		$101
80GB	5400rpm	4D080H4		$112
80GB	7200rpm	6L080J4		$118
120GB	5400rpm	4G120J6		$169
160GB	5400rpm	4G160J8		$255
SEAGATE				
20GB	5400rpm	ST320410A		$65
20GB	7200rpm	ST320011A		$73
40GB	5400rpm	ST340810A		$70
40GB	7200rpm	ST340016A		$81
60GB	7200rpm	ST360021A		$89
80GB	7200rpm	ST380021A	★	$107
I B M				
40GB	7200rpm	07N8450		$84
60GB	7200rpm	07N9209		$103
80GB	7200rpm	07N9210		$118
120GB	7200rpm	07N9219	★	$149
SAMSUNG				
20GB	5400rpm	SV2011H		$71
40GB	5400rpm	SV4002H		$74
40GB	7200rpm	SV4004H		$79
60GB	5400rpm	SV6003H		$85
80GB	5400rpm	SV8004H		$99
80GB	7200rpm	SP8004H		$108
Western Digital				
20GB	7200rpm	WD200BB		$73
40GB	7200rpm	WD400BB		$85
60GB	7200rpm	WD600BB		$107
80GB	7200rpm	WD800BB		$120
80GB	7200rpm	WD800JB		$130
100GB	7200rpm	WD1000BB		$177
100GB	7200rpm	WD1000JB		$198
120GB	7200rpm	WD1200BB		$194
120GB	7200rpm	WD1200JB		$180
180GB	7200rpm	WD1800BB	★	$245

2.5" IDE for Laptops

10GB	IBM	9.5mm	4200rpm	07N7162	$78
10GB	Fujitsu	9.5mm	4200rpm	MHR2010AT	$103
20GB	Toshiba	9.5mm	4200rpm	HDD2168	$100
20GB	IBM	9.5mm	5400rpm	07N9481	$130
20GB	Hitachi	9.5mm	4200rpm	DK23DA20F	$98
30GB	Toshiba	9.5mm	4200rpm	HDD2159	$126
30GB	IBM	9.5mm	4200rpm	07N8326	$162
30GB	Hitachi	9.5mm	4200rpm	DK23DA30F	★ $164
40GB	Hitachi	9.5mm	4200rpm	DK23DA40F	$181
40GB	IBM	9.5mm	4200rpm	07N8327	$162
40GB	IBM	9.5mm	5400rpm	07N9482	$232
40GB	Toshiba	9.5mm	4200rpm	HDD2166	$154
60GB	IBM	12.5mm	5400rpm	07N8328	$381

2.5" to 3.5" Converter Bracket $15

SCSI Hard Drives

External add $99 SCA versions also available.

MAXTOR				
18.4GB	10K rpm	KW018L2	8mb	$178
18.4GB	10K Ultra320	KU018L2	★ 8mb	$183
36.7GB	10K rpm	KW036L4	8mb	$266
36.7GB	10K Ultra320	KU036L4	★ 8mb	$275
73.4GB	10K rpm	KW073L8	8mb	$573
73.4GB	10K Ultra320	KU073L8	★ 8mb	$579
SEAGATE				
18.4GB	7,200rpm	ST318418N	2mb	$158
18.4GB	7,200rpm	ST318438LW	2mb	$150
18.4GB	10,000rpm	ST318406LW	★ 4mb	$169
18.4GB	15,000rpm	ST318452LW	8mb	$234
36.7GB	10,000rpm	ST336706LW	4mb	$252
36.7GB	15,000rpm	ST336752LW	8mb	$395
73.4GB	10,000rpm	ST373405LW	4mb	$547
181GB	7,200rpm	ST1181677LWV	16mb	$1336
I B M				
18.3GB	10,000rpm	07N6350	4mb	$169
18.4GB	15,000rpm	07N6800	4mb	$238
36.7GB	10,000rpm	07N6340	4mb	$239
36.7GB	15,000rpm	07N6801	4mb	$381
146GB	10K Ultra320	08K0322	★ 8mb	$1050
146GB	10K Ultra320	08K0362	★ 8mb	$1050
Hitachi				
18.4GB	10,000rpm	DK32DJ-18MW	4mb	$175
36.9GB	10,000rpm	DK32DJ-36MW	4mb	$279
73.9GB	10,000rpm	DK32DJ-72MW	4mb	$579

Ultra320 Drives require Adaptec's Ultra320 Controller to achieve full performance - A39320D $259

SCSI Externals

MAXTOR				
18.4GB	10K rpm	KW018L2	8mb	$278
18.4GB	10K Ultra320	KU018L2	8mb	$283
SEAGATE				
18.4GB	7,200rpm	ST318418N	2mb	$258
36.9GB	7,200rpm	ST336918LW	2mb	$313
18.4GB	7,200rpm	ST318438LW	2mb	$250
I B M				
18.3GB	10,000rpm	07N6350	4mb	$269
Hitachi				
36.9GB	10,000rpm	DK32DJ-36MW	4mb	$379

CRU

- Convertible Tower
- Eight external accessible 5.25" half-height bay
- Dual 300W load-sharing, hot swappable power
- Built-in SCSI ID Selector
- Overload, over voltage and short circuit protection
- Three high output cooling fans for maximum cooling
- Hot swap capability with CRU DataPort™
- RAID controller not included

DAE-400 $1,599

CDRW/DVD Drives

			Beige	Color
CDRW Drives				
16x10x40	IDE	Pacific Digital U-30105	$69	$109
24x10x40	IDE	BenQ 2410A	$64	$104
24x10x40	IDE	Plextor PXW2410TA/SW	$132	$147
24x10x40	IDE	Yamaha CRW3200EZ	$130	$170
32x10x40	IDE	BenQ 3210A	$61	$101
32x10x40	IDE	GoldStar GCE8320BI	$70	$110
32x10x40	IDE	Sony CRX185A1/C1	$118	$158
32x10x40	IDE	MSI MS8332	$59	$99
32x12x40	IDE	Lite-On LTR32123	$62	$102
40x12x48	IDE	Lite-On LTR40125S	$72	$112
40x12x40	IDE	Plextor PXW4012TA/SW	$145	$160
40x12x48	IDE	Teac CDW540E/KIT	$94	$134
40x12x48	IDE	BenQ 4012P	$70	$110
40x12x48	IDE	TDK VeloCD	$121	$161
40x12x48	IDE	Sony CRX195A1	$121	$161
40x16x48	IDE	Pacific Digital U-30133	$69	$109
48x12x48	IDE	Pacific Digital U-30127	$85	$125
48x12x48	IDE	Lite-On LTR48125S	$90	$130
48x16x48	IDE	BenQ 4816P	$93	$133
12x10x32	SCSI	Plextor PXW1210TS/SW	$215	$255
24x10x40	SCSI	Yamaha CRW3200SZ	$233	$273
DVD Drives				
16x/48x	IDE	Toshiba SDM1612TA	$75	$100
16x/40x	IDE	Pacific Digital U-30115	$59	$84
16x/40x	IDE	Pioneer DVD Slot DVD106	$69	$94
16x/40x	IDE	BenQ DVD1648A	$80	$105
10x/40x	SCSI	Pioneer DVD305S	$104	$129
CD-ROM Drives				
52x	IDE	Lite-On LTN525	$35	$60
52x	IDE	Creative Labs BLASTER52X	$35	$60
52x	IDE	Sony CDU5211	$40	$65
56x	IDE	BTC G621D	$34	$59
40x	SCSI	Plextor PX40TSI	$89	$114

All CD/CD-RW/DVD Drives are available in Black, Blue, Silver, Yellow & Green

USB Drives

USB Hard Drives				
QPS	40GB	5400rpm	USB2.0	$156
QPS	60GB	5400rpm	USB2.0	$205
Buslink	40GB	7200rpm	USB2.0	$173
Buslink	60GB	7200rpm	USB2.0	$190
Buslink	80GB	7200rpm	USB2.0	$238
Buslink	100GB	7200rpm	USB2.0	$334
USB Removable Drives				
Iomega	100MB Zip Ext USB Drive 31197			$89
Iomega	250MB Zip Ext USB Drive 31310			$142
Iomega	Peerless USB Drive w/10GB 31772			$234
USB CDRW Drives				
Plextor	24x10x40 USB 2.0 CD-RW			$182
Iomega	24x10x40 USB 2.0 CD-RW			$181
Yamaha	24x10x40 2.0 CD-RW			$196
Pacific Digital	24x10x40 USB 2.0			$119
Pacific Digital	32x12x48 USB 2.0 Kit			$143
USB DVD Recorders				
QPS	USB 2.0 DVD-R		QPDVRPN1U2	$440
QPS	USB 2.0 DVD-R CD-RW		QPDVRPR1U2	$488
USB DVD/CDRW Combo				
Sony	USB 2.0 20x8x24/8x		CRX85UA2	$274

Orange Micro offers a wide range of USB 2.0 Products. Check our site for details
harddrive.com/orangemicro

Controller Cards

Pacific Digital
DISCSTAQ ADMA Enterprise ATA Controller
Supports Command Queing, freeing up CPU for other tasks. $149.99

SCSI Controllers				
Adaptec	RAID 2000S	$225	19160 Kit	$219
Adaptec	RAID 2005S	$224	29160 Kit	$295
Adaptec	RAID 3210S	$654	29160N Kit	$279
Adaptec	RAID 3400S	$814	39160 Kit	$340
Adaptec	RAID 5400S	$1163		
Adaptec	DuraStor 6200SS Bundle Kit			$6025
Adaptec	DuraStor 7220SS Bundle Kit			$7381
IDE Controllers				
Adaptec	ATA RAID 1200A Kit			$84
Adaptec	ATA RAID 2400A Kit			$320
Promise	ATA133 Card ULTRA133TX2			$49
Promise	ATA100 2ch RAID FASTTRAK100TX2			$87
Promise	ATA100 4ch RAID FASTTRAK100TX4			$133
Firewire Controllers				
Adaptec	1394/Firewire CardBus Kit			$79
Orange Micro	Firewire 3 Port PCI Card			$49
USB Controllers				
Adaptec	USB 2.0 2-port CardBus Kit			$75
Orange Micro	USB 2.0 4 Port PCI Card			$55

Firewire Drives

Firewire Hard Drives				
Buslink	60GB	7200rpm	FW6072E	$190
Buslink	80GB	7200rpm	FW8072E	$238
Buslink	100GB	7200rpm	FW10072W	$285
Buslink	120GB	7200rpm	FW12072W	$313
Maxtor	80GB	5400rpm	X01FWRA080	$212
Maxtor	80GB	7200rpm	Y01FWRA080	$242
Maxtor	160GB	5400rpm	X01FWRA160	$347
QPS	60GB	7200rpm	QPM3HD72F60L	$212
QPS	80GB	7200rpm	QPM3HD72F80L	$235
QPS	100GB	7200rpm	M3HD72F100L	$338
Firewire CDRW Drives				
QPS	32x10x40		CRW321040FL	$187
QPS	40x12x48		CRW401240FL	$222
Yamaha	24x10x40		CRW3200FXZ	$256
Iomega	40x12x48		32359	$211
Firewire DVD Drives				
Addonics	8X DVD/24X		DVD8X24FW	$293
LaCie	DVD-R/RW & CDRW		300164	$468

EasyDisk

PORTABLE HARDDRIVE

Ultra compact size
USB Connectivity
Driverless Installation
PC, Mac, & Linux

64MB	ED1064	$45	256MB	ED1256	$139
128MB	ED1128	$75	512MB	ED1512	$290

MPC1002 P1

★ Awesome Deal!

Copyrighted material

ASUS P4T533-CLAN Socket 478 Mobo

850E Chipset
1066 RDRAM
USB 2.0 - LAN

$143

Seagate 40GB Barracuda IV

Ultra ATA/100
7200rpm - 9ms
2MB Cache

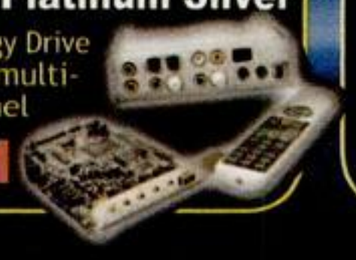
$81

Pacific Digital 48x12x48 BLUE

THE FASTEST CD-RW ON EARTH
80ms (avg)
2MB Cache
6 MB/sec.

$115

Creative Labs Audigy Platinum Silver



Silver Audigy Drive
True 5.1 multi-channel

$201

Intel P4 533 2.8GHz

Intel Pentium 4
2.8GHz Socket 478
512KB Retail

$569

Processors

AMD		INTEL			
1.2GHZ Duron	$59	Xeon 1.8GHz 512 cache			$230
1.3GHZ Duron	$70	Xeon 2GHz 512 cache			$265
Athlon XP1800+	$112	Xeon 2.2GHz 512 cache			$309
Athlon XP1900+	$139	Xeon 2.4GHz 512 cache			$699
Athlon XP2000+	$169	P4 1.8GHz	256k	478	$185
Athlon XP2100+	$205	P4 1.9GHz	256k	478	$195
Athlon XP2200+	$230	P4 2.0GHz	512k	478	$217
		P4 2.26GHz	512k	478	$275
		P4 2.4GHz	512k	478	$449
		P4 2.53GHz	512k	478	$699

F18 Hornet Gaming System

Intel® Pentium® 4 Processor at 2.8GHz
Asus P4T533-C 533MHz w/LAN
ATI Radeon 9700 128MB w/Tv-Out
512MB PC1066 DRDRAM Non ECC

PDC 16X/40X DVD-ROM	Pacific Digital 48x12x48 CD-RW
Creative Labs Audigy Platinum	WD 120GB 8mb Special Edition
Windows XP Professional	Cold Cathode & Matching Drives
Logitech Cordless Freedom Pro	Enermax EG465P-VE 420W PS

$2,650

Monitor & Klipsch Promedia 5.1 Sold Separately

Motherboards

SOCKET A Call for a great deals on a processors!!				
Asus	A7M266	$132	A7A133	$79
	A7N266WPA	$140	A7N266VM	$86
	A7V333AU2	$129	A7V333ARU2F	$150
Abit	KX7-333	$95	AT7	$165
	KX7-333R	$109		
Gigabyte	GA7DXRP	$104	GA7VKML	$80
	GA7VTXHP	$104	GA7VRX	$90
MSI	K7N420PRO	$136	K7TTURBO2	$74
	K7TPRO2	$109	K7T266P2RU	$124
Iwill	XP333	$79	XP333R	$95
SOCKET 370 (Flip Chip/Celeron)				
Asus	TUSL2C-SWA	$97	TUV4X	$83
Intel	D815EGEWU	$94	D815EGEWLU	$104
SOCKET 478 (Pentium 4)				
Asus	P4B533-E	$112	P4B533	$158
	P4T533-C	$109	P4T533	$113
	P4B533-V	$164	P4B266-C	$129
Abit	IT7	$165	BD7II	$109
	KR7A133R	$89	BD7II-R	$125
Iwill	P4D	$85	P4R533N	$145
	mP4G	$115		
Intel	D850MVSE	$152	D850MDL	$157
	D850MV	$147	D850MVL	$155

Dark Knight 2200XP

AMD Athlon™ XP2200+ Processor at 1.8GHz
Dark Knight KickAss Black Hydraulic Modded Case
Case includes 12"Cold Cathode & Clear Acrylic Window
Asus ATA133, RAID 0/1, USB 2.0 512MB DDR 184PIN PC2100
WD 120GB Caviar, 7200rpm Audigy X-Gamer
VisionTek nVidia Geforce-4 TI4600 128MB DDR,w/TV out & DVI
Pacific Digital 48x12x48 IDE CDR-W Black Color
Pacific Digital 16/40 IDE DVD Black Color
Windows XP Home 1.44MB Floppy Black

$1,399

Monitor Sold Separately

Video Cards

ATI		
100-430283	RADEON 7000 64MB	75
100-432001	RADEON 7500 64MB	95
100-431022	RADEON 8500 128MB	175
100-433001	RADEON 9000P 64MB	129
100-433002	RADEON 9000P 128MB	155
100-434003	RADEON 9700P 128MB	359
100-710002	AIW RADEON 8500DV 64MB	179
100-710030	AIW RADEON 8500 128MB	279
EVGA		
064A4NV70S1	GEFORCE4 MX440 64MB	99
064A4NV76S1	GEFORCE4 TI4400 64MB	159
128A4NV78S1	GEFORCE4 TI4400 128MB	259
128A4NV82S1	GEFORCE4 TI4600 128MB	355
MSI		
8870-030	GEFORCE4 TI4200 64MB	149
8870-040	GEFORCE4 TI4200 128MB	189
8872-010	GEFORCE4 TI4600 128MB	359
VISIONTEK		
30001521	GEFORCE4 MX420 64MB	99
30001520	GEFORCE4 MX440 64MB	119
30001646	GEFORCE4 TI4200 64MB	169
30001600	GEFORCE4 TI4200 128MB	219
30001522	GEFORCE4 TI4600 128MB	309

Thermaltake GeForce 4* Highest Performance cooler

$29

NVIDIA GeForce4 Ti4200,Ti4400,Ti4600

Push pin easy to install 3 pin fan connector

Check our site for a full line of Video Cards.

Silver Bullet 1900XP

AMD Athlon™ XP1900+ Processor at 1.67GHz
The Silver Bullet 1900XP Features Silver Color Matched Drives, Keyboard/Mouse Combo, & Altec Lansing Color Matched Speakers
512MB PC133 SDRAM Non ECC 64MB Video
Pacific Digital 16x40x40 CD-RW 56k V.90 Modem
Seagate 40GB 7200rpm 2MB Buffer 10/100 Ethernet
Windows XP Home

$725

Monitor Sold Separately
Viewsonic Silver & Black 17" P70F $227

Sound Cards

Creative Labs	Audigy X Gamer 5.1	$93
Creative Labs	Audigy MP3+	$89
Creative Labs	Audigy Platinum	$176
Creative Labs	Audigy Platinum eX	$221
Creative Labs	Sound Blaster Extigy	$133
Turtle Beach	SantaCruz 512 Voice	$71

Silver Hawk Extreme

Intel® Pentium® 4 Processor at 2.8GHz 533MHz Front Side Bus
Adaptec Ultra320 SCSI Asus P4T533-C 533MHz
140GB Seagate 15K Cheetah ATI Radeon 9700 128MB
512MB PC1066 DRDRAM Non ECC
ThermalTake XaserII 6000 Thermaltake P4 Volcano
12" Cold Cathode, Case Fans w/Blue Led Fans, Neon Switch,
Hardcano, Rounded Cables Enermax 550W Power Supply
40x12x40 Plextor CDRW Silver Pacific digital 16X/40X Silver DVD
Creative Labs Audigy X-Gamer

$2,759

Sales Line: 800-400-3499
WWW.HARDDRIVE.COM

ThorTek Corp. 2800a West Main St League City ,Texas 77573 Lifetime FREE technical support.

Prices & Specs subject to change without notice. Shipping charges are non refundable. Returns may be subject to restocking fee.
Products are covered by manufacturers warranty only. We accept all Government PO's. Local calls 281.557.8336 Fax 281.557.1426

Copyrighted material

Adaptec 2100s RAID SCSI CARD

Single-channel Ultra160 SCSI RAID card w/ cache memory

$420

Seagate 36.7GB Cheetah 36ES

Ultra160 SCSI
10,000rpm
5.2ms access

$245

D-Link AirPlus Enhanced 802.11b

Enhanced 11/22 Mbps
2.4Ghz Wireless

$124

Palm VIIx 8MB with Keyboard

Includes Cradle, Keyboard, Case & Parallel Adapter

$159

KLIPSCH

ProMedia 5.1 Surround Sound

$399

"In a word INCREDIBLE" -IGN.com

Sales Line: 800-400-3499

Computer Cases & Accessories

ATX PC Cases

Aluminum ATX Cases with 420watt P4/AMD power supply and full side window. Available in Green, Yellow, Silver, Black & Blue

HDC Color Case w/Window & P4 420watt $169

We can color match any drive or drive bay accessory to any case listed in our ad! Just ask your sales rep or go to harddrive.com

Thermaltake Xaser II 5000 Built in Hard-Cano 7 & 5 Silent fans
$149

Thermaltake Xaser II A5000B Plus Built in HardCano 7 & 5 fans w/Window
$159

Thermaltake Xaser II A5000A Plus Built in HardCano 7 & 5 fans w/Window
$159

Thermaltake Xaser II 6000 Plus Built in Hard-Cano 7 & 5 fans
$169

Thermaltake Xaser II A6000B Built in Hard-Cano 7 & 5 fans aluminum
$179

Thermaltake Xaser II A6000A Built in Hard-Cano 7 & 5 fans aluminum
$179

ATX288BK 320 watt Black & Silver 9 Bays with Front USB
$79

Nikao MT2000 300watt power Black & Silver
$99

Chieftec Blue Matrix MA-01BLD full tower ATX case
$119

860BLKWN Hydraulic case with window & neon 300watt power
$159

SF860USB Hydraulic case with front usb 300watt Power
$109

Cooler Master ATC210WN320 12" Blue Cold Cathode 320watt Power
$329

Antec SX-1240 Performance Series FULL TOWER 400W CASE
$155

Antec SX1040B 10 Bay Black Per-formance Series Workstation with 300 Watt
$145

Antec SX1030 10 Bay Black Per-formance Series Workstation with 300 Watt
$95

Antec PLUS 1080B ATX Black Full Tower Case With a 430Watt
$145

Antec PLUS 1080AMG ATX Grey Full Tower Case With a 430Watt
$129

Antec PLUS 660AMG ATX Grey Mid Tower Case With a 430Watt
$110

Enermax Power Supplies

Dual Fan P4 Ready
- 300 Watt EG301P-VE $47
- 350 Watt EG365P-VE $55
- 430 Watt EG465P-VE $84
- 550 Watt EG651P-VE $155

Dual Wisper Fan P4 Ready
- 350 Watt 365P-VE $64

Antec Power Supplies

330W	TRUE330	$56
380W	TRUE380	$75
430W	TRUE430	$80
550W	TRUE550	$115
	TRUEBLUE480	$105
	510W FOR DUAL AMD	$105

PC Mods

Fans & Grills

Fan Grills

Radiation
80mm $17
92mm $19
120mm $22

Biohazard
80mm $18
92mm $20
120mm $24

Atomic
80mm $17
92mm $19
120mm $22

Swirl
80mm $19
92mm $22
120mm $25

Standard Grills

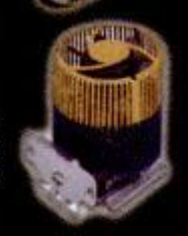
ThorTek	80mm	$6
ThorTek	92mm	$7
ThorTek	120mm	$8

Case Fans

Sunon	80mm	$13
Sunon	92mm	$17
Sunon	120mm	$21

CPU Fans

Thermaltake Volcano 9 AMD Athlon XP up to 2600+
$27



Thermaltake DRAGON ORB 3 AMD Athlon 1.5GHz+
$29

Thermaltake VOLCANO 7 INTEL Socket 370 & AMD Socket 462
$19

Thermaltake VOLCANO 7+ Intel™ P4 478 & AMD™ Athlon XP
$29

Thermaltake Active Memory Cooling Kit PC2100/PC100/133
$19

Arctic Silver III
99.8% pure micronized silver compound
$6

Thermaltake Crystal Orb VGA Card Chip Cooler
$19

Thermaltake Golden HardCano 5 Hard Drive Cooler
$34

Zalman Pure Aluminum And Copper Combined CPU Cooler For Socker A(462) and 370. Zalman's CPU Coolers do not generate noise and vibration in Silent Mode.
$28

Neons

10" Neon Accent	Blue, Green, Red, Black	$24
12" Cold Cathode Neon	Blue, Green, Red	$39
6' Neon Glow Wire	White, Red	$39
Neon Power Adapter	standard power connector	$2

Window Etchings

Bio-Hazard Etched Applique	$12
Atomic Etched Applique	$8
Radio Active Etched Applique	$8

Water Cooling Kits

CPUFX Complete Water Cooling Kit $199

Window Kits

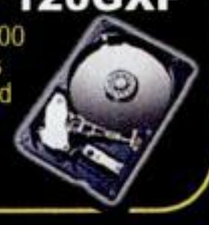
Rectangle	$25
Round	$25
Oval	$25
L-Shaped	$30

We can install any window into a case you buy from us for a $35 labor

WWW.HARDDRIVE.COM

Copyrighted material

IBM 120GB Deskstar 120GXP
120GB Ultra ATA/100
7200rpm - 8.5ms
100MB per second
3 year warranty
$149



Pacific Digital DiscStaq
ATA100 PCI Controller
Command Queuing optimized for IBM Drives
$149

Pioneer DVR-A04 DVD Burner
$319

HDC Mobo/CPU/Case Builder Combo
AMD ATHLON XP1900
64MB VIDEO - 10/100
56K V.90 - USB
AUDIO - 320W 7 BAY
$209

ATI Radeon 9700 Pro AGP
$359
128MB with TV Out

Featured Products

We stock thousands of Black, Silver, Yellow, Green & Blue Components.
Check Page 1 of our ad for all the CD/DVD/CD-RW Drives we carry.

Creative Labs Audigy Platinum - Available in Black, Silver, Yellow, Blue & Green
$201

Keyboard Mouse Speaker Combo Kits available in the same assorted colors!
$35

Rounded Cables

18"	Rounded Ultra ATA Cable	$10.00
24"	Rounded Ultra ATA Cable	$15.00
36"	Rounded Ultra ATA Cable	$15.00
24"	Rounded Ultra Floppy Cable	$10.00

CABLES AVAILABLE IN
RED,BLUE,GREEN,PURPLE,CLEAR,GOLD,SILVER
GREEN,YELLOW,BLACK,GREY

Media

CD &CD-RW Media

24X 80Min 100 Spindle LED1C	$47

See our web site for other incredible prices!

DVD Media

DVD-R 4.7GB Single Side 01892	$5.95
DVD-R 4.7GB Single Side 50 SPindle R470S50	$266
DVD+R 4.7GB Single Side 16022	$7.25

CD/CD-RW/DVD Accessories

Drive Cleaner Allsop 23934	$16.99
Disc cleaning wipes Allsop 50100	$4.99
CD scratch repair system Allsop 58200	$11.99
Radial CD scratch repair system Allsop	$27.99
Disc Removable Labels qty 20 20101	$11.99
4 pack CD Markers Blk/Blu/Red/Grn 84088	$6.99

MPC1002 P4

Monitors

BenQ					
V772	17"	CRT	1280x1024	.23mm	$159
FP751	17"	LCD	1280x768	.264mm	$649
FP2081	20.1"	LCD	1600X1200	.25mm	$1909
Samsung					
151S	15"	LCD	1024x768	.297mm	$389
170MP	17"	CRT	1280x1024	.25mm	$179
Viewsonic					
E70F	17"	CRT	1280x1024	.24mm	$189
G70FMB	17"	CRT	1280x1024	.23mm	$209
E90FMB	19"	CRT	1600X1200	.21mm	$279
LCD17M	17"	LCD	1280x1024	.264mm	$689
VE800	18.1"	LCD	1280X1024	.25mm	$939
VP201MB	20.1"	LCD	1600X1200	.294mm	$1699
VP230MB	23.1"	LCD	1600x1200	.294mm	$3289

Speakers

Creative Labs

Inspire4400	5pc	41W	$52
Inspire5300	6pc	48W	$83
Inspire5700	6pc	79W	$242
SW320	3pc	21W	$40
FPS1600	5pc	45W	$52

Logitech

Z560	5pc	400W	$155
Z540	5pc	40W	$69
Z340	3pc	-	$242

Altec Lansing

621	3pc	200W	$112
641	5pc	400W	$145
ATP3	3pc	-	$59
ATP4	5pc	80W	$110
AL2100	3pc	40W	$73
AL4100	5pc	140W	$110

Networking

Network Hubs

3Com OfficeConnect 8 Port Hub	$85
3Com 16 Port Eth. Hub	$179
Linksys 24-Port Hub	$239
D-Link 5 Port Switch	$75
Netgear 16-Port Hub 10/100	$189
Linksys 8-Port 10/100 Hub	$67

Network Cards

Jaton 10/100 PCI Eth. Card	$17
Netgear 10/100 PC Card	$64
D-Link 10/100 PCI Eth. Card	$27
ConnectGear 10/100 PCMCIA	$29
LANPRO PCI 10/100 Ethernet Card	$50
Intel PRO/100+ Fast Ethernet PCI	$55
Netgear PCI 10/100BaseTX NIC	$20
Generic 10/100 PCI	$15
Allied Telesyn 10/100 PCMCIA	$53
Intel Pro/100S CardBus 10/100	$84
Xircom PCMCIA 10/100 and 56K Modem	$114
Intel CardBus II 10/100 w/RealPort	$48

Network Routers

Linksys Wrls Router w/4 Port	$169
Linksys Router 8-Port	$133
SOHO 17 Port 10BASE-T/2 Hub	$89

Print Servers

Linksys Wireless Print Server	$112
Hawking 3-Port Eth. Print Server	$159

Special Purchase

HERCULES XP1900

$675
17" Flat CRT Monitor Included!!

AMD Athlon™ XP1900 Processor at 1.6GHz
Keyboard/Mouse Combo, & speakers

512MB PC133 SDRAM	64MB Video
48x12x48 CD-RW Drive	56k V.90 Modem
40GB 7200rpm 2MB Buffer	10/100 Ethernet
Windows XP Home	

Wireless Networking

SMC Networks

EZ Connect 802.11a High-Speed Wireless LAN
The Perfect solution for your home or business

SMC2735W
EZ Connect 802.11a Wireless CardBus Adapter
$145

SMC2755W
EZ Connect 802.11a Wireless Access Point
$366

LINKSYS

WCF11
11Mbps Wireless Network CF Card $112

WPS11
EtherFast 11Mbps Wireless Print Server $112

WPS11
EtherFast Wireless AP+ Cable/DSL Router with 4 port switch $169

WPC11
11Mbps Instant Wireless Network PC Card $87

D-Link
Building Networks For People

DWL900AP
802.11B Wireless Access Point $144

DWL520
802.11B Wi-Fi Compatible PCI Adapter $88

DWL650
802.11B Wireless PCMCIA Card $79

Sales Line: 800-400-3499
WWW.HARDDRIVE.COM

ThorTek Corp. 2800a West Main St League City ,Texas 77573 Lifetime FREE technical support.

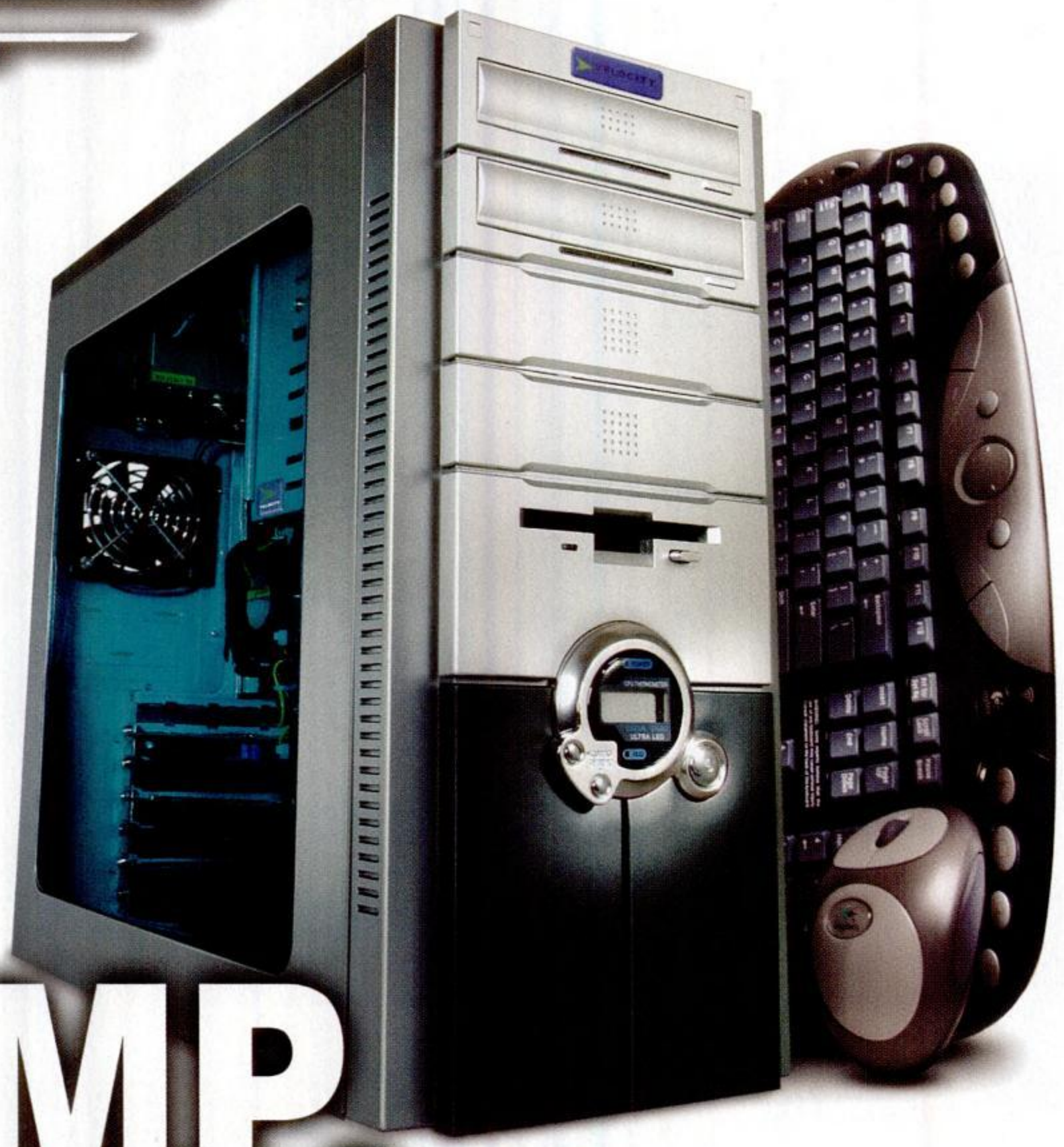
Prices & Specs subject to change without notice. Shipping charges are non refundable. Returns may be subject to restocking fee. Products are covered by manufacturers warranty only. We accept all Government PO's. Local calls 281.557.8336 Fax 281.557.1426

Copyrighted material

VELOCITY micro

"Bottom Line: Add Velocity Micro to our short list of highly recommended premier system builders."
Editor's Choice
PC Gamer, July 2002

"Record-setting scores and elite components put the ProMagix in league with the big boys."
Kick Ass Product
MaximumPC
August 2002



PUMP it UP!

ProMagix PX-W

NoteMagix S56

Don't Alienate yourself. You have a better option.

Velocity Micro offers hand-built custom computer systems that are nearly as gorgeous as they are powerful. Individually tuned and tweaked for maximum performance, we prove that a computer is far more than the sum of it's parts. Priced for any budget, we cover the range from dedicated gaming rigs and A/V systems, to CAD workstations, supremely powerful notebooks, and even corporate computers. Try our online system wizard today to custom configure your perfect system, and Pump-Up your experience to the next level.

www.velocitymicro.com

1-800-303-7866

© 2002 by Velocity Micro, Richmond VA .

Copyrighted material

AMD Athlon PROCESSOR XP

"The AMD Athlon XP Processor Extreme Performance for Windows XP"

- Experience new levels of gaming intensity with up to 16% gain in performance
- Manipulate digital video and graphics files up to 21% faster.
- Enjoy smooth multitasking when using multiple peripherals and programs.
- Make gaming opponents wish they had an AM-Comps Hercules & Zeus AMD Athlon XP based system.
- Experience crystal-clear DVD and CD-Rom playback
- Increase productivity by upto 22% on business applications.
- Design and update websites with ease. (requires additional software and experience)
- Download family photos and watch them appear in a flash.
- Burn CDs at lightning speed with fast file downloads.

AM-COMPS.COM

Where Power, Performance & Quality Meet

GODZILLA 5000

Dual AMD Athlon MP processors
Dual 35 GB SCSI U160 15000 RPM Hard drive
Dual 3com 10/100 Network card
2 GB pc 2100 DDR ECC registered Memory
nVidia GeForce 4 TI 4600 128 Mb DDR W/TV out &DVI
Creative Sound blaster Audigy PLATINUM & Altec Lansing versa tile 251 6 Pcs subwoofer system
16X DVD Rom & 32X10X40 CDRW
US Robotic 56K V90 Modem
Adaptec Ultra 160 SCSI controller
AMD 760 MP chipset W/64 Bit PCI
Logitech optical Freedom wireless keyboard & mouse
Microsoft Windows XP Pro
ATX 460 W AMD Approved see through W/ Neon light

AMD Athlon MP 2100+	**$3999.00**
AMD Athlon MP 2000+	**$3699.00**
AMD Athlon MP 1900+	**$3599.00**

ZEUS 4000

VIA KT-333 MHZ DDR 4X AGP MB W/Raid controller
1 GB PC 2700 DDR 333 MHZ Memory
120 GB 7200 RPM Ultra ATA 133 Hard drive
16X DVD Rom & 32X10X40 CDRW
nVidia GeForce 4 TI 4200 128 Mb DDR W/TV out & DVI
Antec case W/400W true power AMD certified W/ Round IDE cables
Logitech wire less keyboard and mouse
56K Modem & 10/100 net work card
IEEE fire wire 1394 @$29.00
Win XP Home Edition
Creative Sound blaster 5.1 & Altc Lansing 5 Pcs Subwoofer system

AMD Athlon XP processor 2200+	**$1399.00**
AMD Athlon XP processor 2100+	**$1349.00**
AMD Athlon XP processor 2000+	**$1299.00**

HERCULES 3000

VIA KT-333 MHZ DDR 4X AGP MB W/Raid controller
512 MB PC 2700 DDR 333 MHZ Memory
60 GB 7200 RPM Ultra ATA Hard drive
16X DVD Rom & 32X10X40 CDRW
nVidia GeForce 3 TI 500 64 Mb DDR W/TV out & DVI
Antec case W/300W true power AMD certified W/ Round IDE cables
Logitech wire less key board and mouse
56K Modem & 10/100 net work card
IEEE fire wire 1394 @$29.00
Win XP Home Edition
3D Wave Sound & Altec Lansing 3 Pcs subwoofer system

AMD Athlon XP processor 2200+	**$999.00**
AMD Athlon XP processor 2100+	**$959.00**
AMD Athlon XP processor 2000+	**$899.00**

MEDUSA 2000

VIA KT-333 MHZ DDR 4X AGP MB W/Raid controller
256 MB PC 2700 DDR 333 MHZ Memory
40 GB Ultra ATA Hard drive
16X DVD Rom & 32X10X40 CDRW
nVidia GeForce 2 MX 64 Mb DDR video card
Mid Tower 300 W ATX case
PS/2 keyboard and mouse
56K Modem & 10/100 Network card
IEEE fire wire 1394 @$29.00
Win XP Home Edition
3D Wave Sound & 120 W PMPO desktop speakers

AMD Athlon XP processor 2200+	**$699.00**
AMD Athlon XP processor 2100+	**$659.00**
AMD Athlon XP processor 2000+	**$599.00**

FREE GROUND SHIPPING ON ALL SYSTEMS PURCHASED THROUGH 12-31-2002

888-905-9700 www.am-comps.com

AM-COMPS.COM 1 Albertson Ave, Albertson, NY 11507
PHONE: 516-626-7000 FAX: 516-626-7001
OUR OFFICE HOURS: 10:30 AM to 7:00 PM Eastern standard Time.

Price, specification, and terms are subject to change without notice. Systems carry one year parts and labor warranty. AMD XP 2200+ with Quantispeed architecture outperforms 2.20 GHz processors, Quantispeed architecture operates at 1.8 GHz. AMD XP 2100+ with Quantispeed architecture outperforms 2.10 GHz processors, Quantispeed architecture operates at 1.73 GHz. AMD XP 2000+ with Quantispeed architecture outperforms 2.00 GHz processors, Quantispeed architecture operates at 1.67 GHz.

Copyrighted material

WWW.iBUYPOWER.COM

NIGHT DREAMER XP

- ~ AMD Athlon XP Processor 2000+ with QuantiSpeed Architecture outperforms competitive 2.0GHz processors
- ~ <BLACK> Aluminum 8-Bay Super Light Weight Tower Case w/420 Watt Power + See Through Window + Sound Activated Neon Light
- ~ VIA KT400 Chip DDR400 8x AGP Main Board w/ USB 2.0 Ports
- ~ 512MB DDR400 PC-3200 Memory
- ~ 80GB 7200RPM Ultra ATA-133 Hard Drive
- ~ <BLACK> 16x DVD-ROM Drive
- ~ NEW!!! <BLACK> 40x12x40 CD-RW Drive
- ~ <BLACK> 1.44MB Floppy Drive
- ~ nVidia Geforce-4 Ti-4600 128MB DDR 4X AGP Video
- ~ Sound Blaster Audigy 5.1 Sound Card w/IEEE Fire Wire
- ~ Creative Inspire 5.1 5300 Surround Sound Speakers
- ~ 56K V.90 Fax/Modem w/Voice
- ~ NEW!!! USB 2.0 Port x2 + USB 1.1 Port x2
- ~ <BLACK> 19" ViewSonic Perfect Flat E90FB .21H MM Monitor
- ~ Microsoft Optical IntelliMouse Explorer
- ~ <BLACK> Enhanced Multi-Media Keyboard
- ~ Microsoft Windows XP PRO Edition
- ~ FREE Norton AntiVirus 2002 CD
- ~ Free 1-Year 24/7 ***i-Care*** Deluxe Technical Support + On-Site Service

$ 1599

AMD Athlon XP Processor 2400+	$ 1709
AMD Athlon XP Processor 2600+	$ 1759

TITANIUM XP

- ~ NEW!!! INTEL® Pentium® 4 Processor at 2.53GHz with 533MHz FSB
- ~ <SILVER> Aluminum 8-Bay Super Light Weight Tower Case w/ 420 Watt Power + See Through Window + Sound Activated Neon Light
- ~ INTEL® 850E 533MHz FSB PC1066 4x AGP Main Board
- ~ 512MB PC1066 RAMBUS Memory
- ~ 80GB 7200RPM Ultra ATA-133 Hard Drive
- ~ <SILVER> 16x DVD-ROM Drive
- ~ <SILVER> PLEXTOR 40x12x40 CD-RW Drive
- ~ <SILVER> 1.44MB Floppy Drive
- ~ nVidia Geforce-4 Ti-4600 128MB DDR 4X AGP Video
- ~ Sound Blaster Audigy 5.1 Sound Card w/IEEE Fire Wire
- ~ 10/100 Network LAN
- ~ Klipsch ProMedia 4.1 THX 400-Watt Surround Sound Speakers
- ~ 3COM USR 56K V.90 Fax/Modem w/Voice
- ~ <BLACK> 19" ViewSonic Perfect Flat E90FB .21H MM Monitor
- ~ Microsoft Optical IntelliMouse Explorer
- ~ <SILVER> Enhanced Multi-Media Keyboard
- ~ Microsoft Windows XP PRO Edition
- ~ FREE Norton AntiVirus 2002 CD
- ~ Free 1-Year 24/7 ***i-Care*** Deluxe Technical Support + On-Site Service

$ 2209

Intel® Pentium® 4 Processor 2.66 GHZ	$ 2259
Intel® Pentium® 4 Processor 2.80 GHZ	$ 2369

TOLL FREE 888. 462.3899

Price, Specification and terms are subject to change without notice. Picture may differ from actual products. We are not responsible for errors in typography and/or photography. 30-day money back guarantee does not include opened software, parts, or special order merchandise.

Original shipping and handling fee along with return shipping charge are non-refundable. Products returned after 30 days or in a non-refundable condition are subject to a restocking fee. * 3 year limited warranty includes 3 years labor and 1 year parts only.

Sales Hour: Mon~Fri 7:30AM-6:00PM, Sat 10AM-3PM PST
602 Monterey Pass Rd., Monterey Park CA 91754
Tel: (626) 281-8262 Fax: (626) 281-0767
All Prices effective on Sep. 25, 2002

Copyrighted material

TCWO.com 1.800.941.2750

GA-7VAXP Motherboard

Gigabyte and AMD CPU have entered a new world of speed with the GA-7VAXP. Built on the brand new VIA KT400 chipset, this motherboard has all the features you can want in a performance motherboard. It supports DDR memory at 400, 333, 266, and 200 MHz. Supports the newest 8x AGP cards that are now hitting the market, an incredible speed upgrade from 4x AGP. This motherboard also features an integrated RAID133 controller and supports USB 2.0. Who could ask for anything more?

Upgrade today for $119

AMD PROCESSORS

ATHLON XP	
Athlon XP 2200+	$145
Athlon XP 2100+	$120
Athlon XP 2000+	$94
Athlon XP 1900+	$84
Athlon XP 1800+	$70
Athlon XP 1700+	$65
ATHLON CLASSIC	
Athlon 1.4 GHz	$84
Athlon 1.33GHz	$55
ATHLON MP	
Athlon MP 2100+	$249
Athlon MP 2000+	$193
Athlon MP 1900+	$172
AMD DURON	
Duron 1.3 GHz	$51
Duron 1.2 GHz	$42
Duron 1.1GHz	$41
Duron 1.0GHz	$39

INTEL PROCESSORS

PENTIUM 4	
2.53 GHz 533FSB 512K	$473
2.4B GHz 533FSB 512K	$355
2.26 GHz 533FSB 512K	$242
2.0 GHz 400FSB 512K	$194
1.8A GHz 400FSB 512K	$165
1.7 GHz 400FSB 512K	$139
1.6A GHz 400FSB 512K	$164
PENTIUM III FCPGA/2	
P-III 1.4 GHz 512k	$302
P-III 1.2 GHz 256k	$114
P-III 1.13 GHz 256k	$108
P-III 1.0 GHz 256k	$129
CELERON FCPGA2/478	
Celeron 1.8GHz s478	$106
Celeron 1.7GHz s478	$86
Celeron 1.3GHz s370	$78

COOLING ACCESS.

COOLERMASTER	
SocketA & 370	
SuperCool Aluminum	$8
AMD Appvd Aluminum	$8
70mm Fan Jumbo Alum.	$9
HCC 7k RPM Pure Cu	$25
HHC 7k RPM Cu Pipe	$34
HHC- Low noise Cu Pipe	$34
Univ. 80MM Case	$8
THERMALTAKE	
Volcano5 AMD App	$10
Volcano6cu+ Copper 7K	$13
Volcano7 SocktA	$22
Volcano7+SktA/478 CU	$40
Univ. Var-Spd 80MM Case	$12
Active Mem Cooling Kit	$12

USB

64MB USB Thumb Drive	$46
128MB USB Thumb Drive	$82
USB 2.0 4port PCI Card	$23
USB 2.0 4port HUB	$35
USB 2.0 EXT ENCL	$79
USB 2.0 A-to-B cable 6ft	$4

STORAGE

MAXTOR	
20GB 100/5400/2MB	$61
20GB 100/7200/2MB	$66
40GB 133/7200/2MB	$78
60GB 100/5400/2MB	$82
60GB 133/7200/2MB	$96
81GB 100/5400/2MB	$96
81GB 100/7200/2MB	$113
120GB 100/5400/2MB	$154
160GB 133/5400/2MB	$248
WESTERN DIGITAL	
20GB 100/7200/2MB	$69
40GB 100/7200/2MB	$79
60GB 100/5400/2MB	$92
60GB 100/7200/2MB	$97
80GB 100/7200/2MB	$105
100GB 100/7200/2MB	$155
100GB 100/7200/8MB	$175
120GB 100/7200/2MB	$178
120GB 100/7200/8MB	$191
IBM	
40GB 100/7200/2MB	$75
60GB 100/7200/2MB	$85
80GB 100/7200/2MB	$87
120GB 100/7200/2MB	$147
IOMEGA	
100MB IDE Int. Zip	$43
250MB Internal	$69
250MB EXT USB	$133
250MB EXT PAR	$138

CONTROLLERS

TCW PCI ATA133	$26
TCW PCI ATA133 RAID	$36
PROMISE	
PCI ATA133	$35
PCI ATA133 RAID	$84

DRIVE COOLING

PCI Slot System	$7
3.5" SGL FAN HDD	$11
5.25" DUAL FAN HDD	$19
Coolermaster Alum HDD	$29

ACCESSORIES

MITSUMI	
PS/2 Scroll Mouse	$7
PS/2 Keyboard	$9
PS/2 Internet Keyboard	$12
Black Optical PS/2 mse	$11
MICROSOFT	
Intellimouse Optical	$24
Natural Keyboard	$23
Office Keyboard	$28
KEYTRONICS	
Black Keyboard & Scroll MSE Combo	$29

MODEMS

Intel v.92 PCI Spkr	$17
Lucent v.92 PCI	$15
US ROBOTICS	
WinModem 56K PCI	$24
Hardware 56K PCI	$49
External 56K	$93

VIDEO CARDS

POWERCOLOR-NVIDIA	
Geforce2 MX400 64MB	$49
Geforce2 Ti 64MB 64MB	$90
GeForce3 Ti200 64MB	$111
GeForce4 Ti4200 128MB	$173
GeForce4 Ti4600 128MB	$359
PNY - NVIDIA	
GeForce4 MX420 64MB	$84
GeForce4 MX440 64MB	$105
GeForce4 Ti4400 128MB	$255
GeForce4 Ti4600 128MB	$333
VISIONTEK - NVIDIA	
GeForce3 Ti500 64MB	$219
GeForce4 MX440 64MB	$134
GeForce4 Ti4600 128MB	$388
Powercolor - ATI Powered	
Rage Mobility 8MB	$16
Xpert2000 Pro 32MB	$35
Radeon 7000 SD 64MB	$47
Radeon 7500LE PCI 64MB	$80
Radeon 7500 DDR 64MB	$68
Radeon 8500LE 64MB	$128
ATI - Built by ATI	
AIW 7500 64MB	$175
AIW 8500DV 64MB	$262
MATROX	
Millennium G550 32MB	$96
Parhelia 128MB OEM	$call
Powercolor - SiS Powered	
Revenger SiS315 128MB	$59
SiS Xabre400 8X 128MB	$109

SOUND CARDS

CREATIVE LABS	
Live Value 5.1	$35
Audigy 5.1	$65
Audigy MP3 5.1	$81
Audigy X-Gamer 5.1	$87
Audigy Platinum	$175
Extigy	$140

CASES

Midtower 350w Black	$64
Enlight Mid 7237 USB	$66
FullTower 300w	$68
Full Hydraulic	$98
Aluminum w/Window	$189
Blk Aluminum w/Window	$189
ANTEC	
KS282 300W MID Beige	$62
PERF PLUS 330W Beige	$128
PERF PLUS 430W Beige	$144
PERF PLUS 430W Black	$149
COOLERMASTER- Aluminum	
ATC-101-SX4 w/o PS	$245
ATC-110-SX1 w/o PS	$271
ATC-201-SX w/o PS	$183
ATC-210-VX1 w/o PS	$211
CASE ACCESSORIES	
80MM fan guard	$3
6pk Case thumbscrews	$4
Blue Cold Cathode	$25
Green Cold Cathode	$25

MEMORY

LIFETIME WARRANTY

DDR *(Call or log on for latest price)*	
256MB PC2100	$62
512MB PC2100	$127
256MB PC2100 REG	$87
512MB PC2100 REG	$173
1.0GB PC2100 REG	$382
256MB PC**2700**	$71
512MB PC**2700**	$142
SDRAM *(Call or log on for latest price)*	
64MB PC100	$18
128MB PC100	$27
256MB PC100	$50
64MB PC133	$18
128MB PC133	$25
256MB PC133	$49
512MB PC133	$81
256MB REG NON-ECC	$52
256MB REG ECC	$62
512MB REG NON-ECC	$94
512MB REG ECC	$103
RAMBUS *(Call or log on for latest price)*	
128MB PC800 NON-ECC	$53
256MB PC800 NON-ECC	$98
128MB PC800 ECC	$55
256MB PC800 ECC	$107
512MB PC800 ECC	$298
EDO *(Call or log on for latest price)*	
16MB 4X32-60 EDO	$11
32MB 8X32-60 EDO	$18

FPM & Parity Available!

NETWORKING

SWITCHES/HUBS	
8port 10Mb	$19
8port 10/100 Switch	$33
16port 10/100 Switch	$79
Linksys Cable/DSL Rout.	$76
Wireless Also Available!	
NETWORK ADAPTERS	
TCW Realtek	$9
3Com	$32
Intel Pro 100/s	$26
Intel Pro/1000MT	$53

CD ROMS

54X Mitsumi	$26
52X Asus	$29
52X Creative Labs	$29
52X Lite-On	$25

DVD ROMS

16X Samsung	$48
16X Toshiba	$42
16X Lite-On	$39
16X Lite-On Black	$49

CD-RW

32/12/40 Mitsumi BLK	$70
32/10/40 Lite-On	$57
32/10/40 Lite-On BLK	$76
40/12/48 Teac	$90
40/12/48 Lite-On	$67
48/12/48 Lite-On	$90

MOTHERBOARDS

PENTIUM4/CELERON SCKT478	
GIGABYTE	
GA-8IE i845E 533FSB DDR	$98
GA-8IEXP i845E 533F DDR	$139
GA-8IHXP i850E 533F RDR	$175
SOYO	
P4S DRAGON DDR	$156
P4SY645DX DRAG. DDR	$158
ASUS	
P4B533 i845E 533FSB DDR	$156
P4B533E i845E 533FS DDR	$190
ATHLON/DURON SOCKETA	
GIGABYTE	
GA-7VRX KT333 DDR	$80
GA-7VRXP KT333 DDR	$106
GIGABYTE DUAL SCKTA	
GA-7DPXDW A760MPX	$261
MICROSTAR	
KT3 ULTRA KT333 DDR	$79
KT3 ULTRA-ARU KT333 DDR	$114
MICROSTAR DUAL SCKTA	
K7D MASTER A760MPX	$211
SOYO	
DRAGON LITE KT266A DDR	$89
DRAGON PLATINUM	$176
ASUS	
A7S333 SiS DDR	$70
A7V333R KT333 DDR	$147
A7N266E N420D DDR	$166
ASUS DUAL SCKTA	
A7M266D A760MPX	$231

SPEAKERS

ALTEC LANSING	
AVS200 2 Piece	$19
AVS300 3 Piece	$33
AVS500 5 Piece	$48
ACS48 3 Piece	$68
KINYO	
SW-4315 3pc 240W	$32
TA-410 5 Piece 360W	$34
TA-927 Black 5pc 360W	$42
TW-6515 3pc 480W	$69
TW-527 5.1 - BLK	$69
LOGITECH	
Z340 2.1 33W RMS	$43
Z560 4.1 400W RMS	$148

MONITORS

17"	
AOC 7ELR .23hdp	$149
AOC 7F .21hdp Flat	$158
AOC 7E-BLK .23hdp	$156
AOC 7F-SLK .23hdp	$179
19"	
AOC 9GLR .21 mdp	$200
AOC 9KLR .21 hdp	$233
LCD Displays	
AOC 15" LM500	$368
AOC 17" LM700	$565
Cornea 15" CT1501	$352
Cornea 17" MP704 BLK	$579
Cornea 17" CT1700	$554
Cornea 18" CT1870	$660

All with Three Year Warranty!

TCWO.com

Sales Hours : Mon-Fri 9AM-7PM EST
Technical Support Hours : Mon-Fri 10AM-6PM EST
Sales and Customer Service : 1.800.941.2750
Technical Support Line : 1.800.407.3232

Price, specification, and terms are subject to change without notice, Thompson's Computer Warehouse is not responsible for errors in typography and/or photography. Actual items may differ from pictured.

Copyrighted material

Share Your Home Movies On DVD

USB Instant DVD

- Convert Your VHS Tapes To DVD or VCD
- Real-Time Hardware-Based MPEG-2 Encoding/Decoding
- Analog and S-VHS Input

Includes: Ulead VideoStudio 6.0, MyDVD 3.5, Netptune MediaShare 3.0

CREATE DVD OR VCD MOVIES TO WATCH & SHARE

PYRO 1394DV

Includes

- PYRO 1394 DV PCI card & Cable
- Ulead VideoStudio 6.0
- Ulead DVD MovieFactory
- Ulead DVD PictureShow

USB Instant VCD

Includes

- USB Instant VCD MPEG-1 Encoder
- Ulead VideoStudio 6.0
- Ulead DVD PictureShow

PYRO 1394 Drive Kit

Convert Your Internal CD or DVD Recordable Drive To An External 1394 Drive

Includes

- IDE to 1394/FireWire Drive Enclosure
- Cables and Bezel
- ALSO AVAILABLE IN USB 2.0

PYRO PlatinumDV

Includes

- PYRO 1394 DV PCI card & Cable
- Adobe® Premiere® Full Version
- Ulead DVD Workshop

PYRO ProDVD

Includes

- PYRO 1394 DV PCI card & Cable
- Ulead MediaStudio Pro Director's Cut
- Ulead DVD Workshop
- Ulead DVD PictureShow

PYRO A/V Link

Your connection between Digital; Analog Video

- Convert Analog Video to Digital Video (DV)
- Convert Digital Video (DV) to Analog Video

Available everywhere including: Tiger Direct, Safe Harbor, Fry's,Comp USA, Circuit City, Bestbuy.com, FutureShop, DataVision.com, JandR, London Drugs, Microcenter, DVD-gear.com and more!

* CD-RW drive required to create CD-RW discs. DVD recordable drive required to create DVD discs.

Don't Steal Movies. ADS Technologies respects the rights of copyright owners and asks that you do the same.

ADS TECHNOLOGIES

www.adstech.com

800-888-5244

Connect, Create, Store

Copyrighted material

Don't Just Buy Performance,

BUY SMART

G4Ti4200

G4Ti4200-TD
TV-Out, DVI 128/64MB DDR

- Powered by NVIDIA® the 4th generation of graphics processor unit - GeForce4 Ti4200 and 12BMB/64MB DDR SDRAM
- nfiniteFX™ II engine to enable a virtually infinite number of special effects that deliver the next leap in realism to 3D graphics
- nVIDIA Accuview™ Antialiasing technology
- Support high-quality TV-out function
- Support digital image output (DVI-I) to meet the requirement of high-end LCD monitor
- Bundled with supreme valuable 3D game sets and application softwares
- Bundled with DVI-to-VGA converter to enable the pair view output.

G4Ti4400-VTD
128MB DDR / Video-In TV-Out / DVI-Output

- Powered by NVIDIA® the 4th generation of graphics processor unit - GeForce4 Ti4400 and 12BMB DDR SDRAM
- nfiniteFX™ II engine
- nVIDIA Accuview™ Antialiasing technology
- Exclusively support the all-in-one image output/input function (Video-in, TV-out, DVI output)
- Bundled with 10 sets of supreme valuable 3D game collection and 10 sets of application softwares.
- Bundled with Intervideo WinProducer / WinCoder 2.0 and its Professional Users'Pack (MPEG4 engine, VCD burning)

G4MX440-T
TV-Out / 64MB DDR

- Powered by NVIDIA® the 4th generation of graphics processor unit - GeForce4 MX440 with 64MB DDR SDRAM
- nVIDIA Accuview™ Antialiasing technology
- Integrated second-generation Transform and Lighting engines
- Support high-quality TV-out function
- Bundled with 10 sets of supreme valuable 3D game collection and 10 sets of application softwares.

Valuable Software Inside

No One Lives Forever

Aquanox

Sacrifice

WinProducer/WinCoder Professional users' Pack
(for G4Ti4600/4400 only)

WinProducer WinCoder

MSI Driver & Utilities

MSI DVD

7in1 Games Collection

MSI Computer Corp.
901 Canada Court City of Industry, CA 91748
Tel: (626) 913-0828 Fax: (626) 913-0818
URL: www.msicomputer.com

All functions above are optional for all of MSI products *MSI is a trademark of Micro-Star Intil Co., Ltd.*The specification is subject to change without notice.
* All brand names are registered trademarks of their respective owner. * Any configuration other than original product specification is not guaranteed.

Copyrighted material

WWW.BUYXTREMEGEAR.COM

XG6000-GAMER ULTRA SE

- MSI KT3 Ultra ARU VIA KT-333 w/ ATA 133 MB
- Kingston 1024MB PC2700 333 MHZ DDR Memory
- MSI ATA 133 Raid Build-In
- Western Digital 120GB 7200 RPM 8MB Cache Special Edition
- nVidia Geforce-4 TI4600 128MB DDR W/ TV out & DVI
- Sony 32X12X40 CD-RW Drive
- Toshiba 16X DVD-ROM
- Creative Labs Sound Blaster Audigy X-Gamer 5.1 w/ 1394 IEEE
- Creative Cambridge SoundWorks Desk Top Theater 5.1 INSPIRE 5300 Sound System
- Creative Labs 56K V.92 Fax Modem w/ Voice
- 10/100 Network Interface Card
- 4 USB 2.0, 1 Firewire 1394 IEEE Port
- 1.44 MB Floppy Drive & PS2 internet Keyboard
- Microsoft USB OPTICAL IntelliMouse
- Microsoft Windows XP Home Edition
- One Year On Site Service w/ 24/7 Techsupport
- **Aluminum** TurboGamer SX635 Tower Case 420Watt

AMD Athlon™ XP 2600+[1]	$ 1599	XG151
AMD Athlon™ XP 2400+[2]	$ 1525	XG152
AMD Athlon™ XP 2200+[3]	$ 1489	XG153
AMD Athlon™ XP 2000+[4]	$ 1429	XG154
AMD Athlon™ XP 1800+[5]	$ 1409	XG155

MSI · VISA · MasterCard · DISCOVER

• Price subject to change without notice.

1. QuantiSpeed™ architecture outperforms competive 2.60GHz processors, QuantiSpeed™ architecture operates at 2.13GHz.
2. QuantiSpeed™ architecture outperforms competive 2.40GHz processors, QuantiSpeed™ architecture operates at 2.00GHz.
3. QuantiSpeed™ architecture outperforms competive 2.20GHz processors, QuantiSpeed™ architecture operates at 1.80GHz.
4. QuantiSpeed™ architecture outperforms competive 2.00GHz processors, QuantiSpeed™ architecture operates at 1.67GHz.
5. QuantiSpeed™ architecture outperforms competive 1.80GHz processors, QuantiSpeed™ architecture operates at 1.533GHz.

MONITOR UPGRADE

- AquaView 7GS .27 17" 1280x1024 (Black or White Color) ..... $ 129
- AquaView 9GX .25 19" 1600x1200 (Black or White Color) ..... $ 189
- Viewsonic E70F Perfect Flat .23H 17" 1280x1024 (Black or White Color) ..... $ 179
- Viewsonic E90 .22H 19" 1600x1200 (White) ..... $ 229
- Viewsonic E90F Perfect Flat .22H 19" 1600x1200 (Black or White Color) ..... $ 269

XTREME GEAR

XG4000-GAMER PLATINUM XP

- MSI KT3 Ultra-2 VIA KT-333 w/ ATA 133 MB
- Kingston 512MB PC2700 333 MHZ DDR Memory
- Maxtor 80GB 7200 RPM Ultra ATA 133 Hard Drive
- MSI nVidia Geforce-4 TI4200 128MB DDR w/ TV Out and DVI
- Sony 32X10X40 CD-RW Drive
- Toshiba 16X DVD-ROM
- Creative Lab Sound Blaster Live Audigy w/ FireWire 1394 IEEE Port
- Altec Lansing 251 5.1 PC Gaming Desktop Theater Speakers System
- 56K Modem, 1.44MB Floppy,Keyboard & Mouse
- Microsoft Windows XP Home Edition
- One Year On Site Service w/ 24/7 Techsupport
- **-AHANIX Platnium XP Case w/ Digital Thermometer & 420 Watt Power Supply**

AMD Athlon™ XP 2600+[1]	$ 1149	XG131
AMD Athlon™ XP 2400+[2]	$ 1079	XG132
AMD Athlon™ XP 2200+[3]	$ 1045	XG133
AMD Athlon™ XP 2000+[4]	$ 1015	XG134
AMD Athlon™ XP 1800+[5]	$ 965	XG135

XG2000-ELITE

- MSI KT3 Ultra-2 VIA KT-333 w/ ATA 133 MB
- 512 MB PC2700 266MHZ DDR RAM Memory
- 60GB 7200RPM Ultra ATA 100 Hard Drive
- nVidia Geforc-2 MX400 64MB AGP
- Sony 52X CD-ROM, 3D Wavetable Sound
- 480-Watt Subwoofer Speakers System
- 56K Modem, 1.44MB Floppy, Keyboard & Mouse
- Microsoft Windows XP Home Edition
- Black X-Gamer Medium Tower Case with See Through Window and Sound Activated Neon Light 350 Watt

AMD Athlon™ XP 2600+[1]	$ 789	XG111
AMD Athlon™ XP 2400+[2]	$ 715	XG112
AMD Athlon™ XP 2200+[3]	$ 679	XG113
AMD Athlon™ XP 2000+[4]	$ 619	XG114
AMD Athlon™ XP 1800+[5]	$ 599	XG115

XG3000-WORKSTATION

- MSI 845E-MAX-C Intel I845E Chipset 533Mhz FSB MB
- 256MB PC2100 DDR Memory
- 60 GB 7200 RPM Ultra ATA 100 Hard Drive
- MSI nVidia Geforce-4 MX 440 64MB DDR w/ TV-OUT
- 32X12X40 CD-RW DRIVE & 16X DVD-ROM
- MSI 6 Channels 5.1 Surround Sound Card
- 480-Watt Subwoofer Speakers System with See Through Window and Sound Activated Neon Light 350 Watt

Intel® Pentium® 4	2.53Ghz	$ 796	XG121
Intel® Pentium® 4	2.4Ghz	$ 745	XG122
Intel® Pentium® 4	2.0Ghz	$ 709	XG123
Intel® Pentium® 4	1.8Ghz	$ 689	XG124

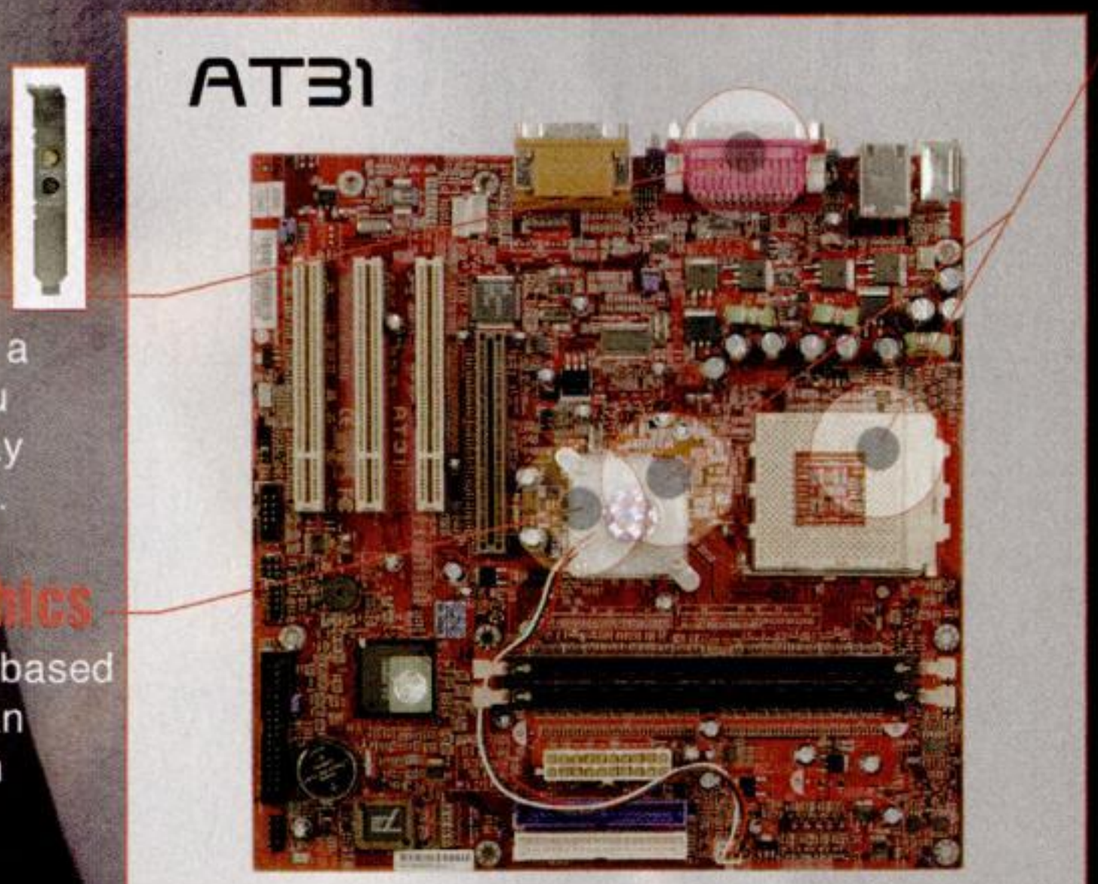
TOLL FREE 1-888-937-5580

Copyrighted material

FUSION

Top Notch Performance and Stability

Supports the latest AMD Athlon™ XP CPUs and features. Enhanced active cooling system for extended use.



RADEON IGP 320 chipset

Dual-Display

Fusion comes with a TV Out card so you can run dual-display right out of the box.

Radeon™ Graphics

World's first ATI™-based motherboard has an embedded Radeon core for excellent 3D performance.

Enhanced DVD Playback

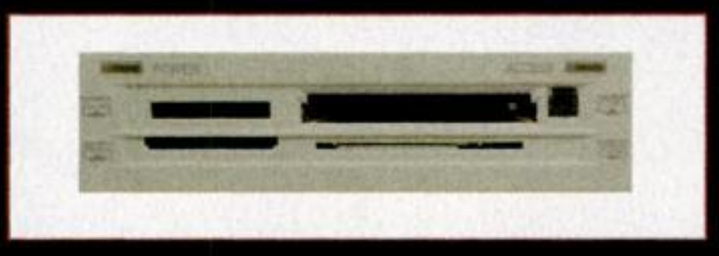
Superior technology for gaming and ultra-fluid DVD playback. Comes with the complete version of PowerDVD XP.

Specifications

- ATI RADEON IGP 320
- Performance K7 uATX mainboard
- Two DDR DIMM, up to 2GB
- RADEON graphics embedded
- Supports DVD H/W acceleration
- Super video support with TV Out connector
- 4X AGP, 3 PCI, LAN on board

Fusion + Memory Commander = FUSION Extreme

Limited Edition



All-in-one memory card reader, fits in 3½" drive bay, provides instant access to all six memory types:

- SmartMedia
- CompactFlash
- SD
- MMC
- Microdrive
- Sony Memory Stick

Fusion just got more powerful. And, while supplies last, you can find limited edition Fusion Extreme (Fusion motherboards bundled with all-in-one memory card readers) at Fry's Electronics. Fusion Extreme gives you instant access to all six memory types, enabling you to instantly expand your media horizons and boost your system's power!

www.fica.com

Outpost.com Fry's Electronics ATi Radeon

Visit Outpost.com or your nearest Fry's Electronics for more information.

FIC

2002 First International Computer, Inc. All rights reserved. FIC and the FIC logo are trademarks of First International Computer, Inc. ATI and RADEON are trademarks and/or registered trademarks of ATI Technologies Inc. All other company and/or product names are trademarks and/or registered trademarks of their respective owners.

Copyrighted material

ABS™ Diablo PCs with the
Intel® Pentium® 4 processor
The center of your digital world

ULTIMATE GAMING MACHINE

ABS™ Diablo X3

Intel® Pentium® 4 Processor at 2.53GHz with 533FSB
Blue Kingwin Aluminum Case w/Acrylic Windows & Neon Light
Enermax 330-Watt Power Supply
Asus P4T533-C Intel 850E Chipset Motherboard w/533FSB & USB 2.0
Kingston 512MB 1066MHz RAMBUS Memory
Western Digital 100GB 7200RPM Ultra ATA100 Hard Drive w/8MB Cache
Pioneer 16X DVD Player & Mitsumi 1.44MB Floppy Drive
40X12X48 SMART-BURN® CD-ReWritable Drive
New Matrox Parhelia™ 128MB Surround Gaming Video Card Supporting 3 Displays w/2 DVI & 1 S-Video
Creative Labs SoundBlaster Audigy Sound Card & Mic
Integrated Intel Network Controller
Microsoft Internet Keyboard & Optical Mouse
Microsoft Windows® XP Home Edition
Free ABS™ PC Organizer (3" Color Binder for Manual, Drivers, etc.)

$1889

ABS™ Diablo X5

Intel® Pentium® 4 Processor at 2.80GHz with 533FSB
Black Kingwin Aluminum Case w/Acrylic Windows & Neon Light
Enermax 550-Watt Power Supply
Asus P4T533-C Intel 850E Chipset Motherboard w/533FSB & USB 2.0
Kingston 512MB 1066MHz RAMBUS Memory
Two Maxtor 80GB Quiet 7200RPM Ultra ATA133 Hard Drives
Promise Fast Track RAID133 Controller
Pioneer 16X DVD Player & Mitsumi 1.44MB Floppy Drive
Plextor 40X12X40 CD-ReWritable Drive
NVIDIA® GeForce4™ Ti 4600 w/128MB Video Card
Creative Labs SoundBlaster Audigy X-Gamer Sound Card w/IEEE 1394
Integrated Intel Network Controller
Black Multimedia Keyboard & Optical Mouse
Microsoft Windows® XP Professional
Free ABS™ PC Organizer (3" Color Binder for Manual, Drivers, etc.)

$2649

LAN Party Perfect

NEC Monitors

NEC 19" FE991SB	Black/White	$299.00
NEC 21" AS120	White	$489.00
NEC 22" FE1250	Black	$649.00

KLIPSCH Speakers

Klipsch ProMedia 2.1 THX-Certified 200W	$179.00
Klipsch ProMedia 5.1 THX-Certified 500W	$399.00

CREATIVE Speakers

Creative Inspire 5300 5.1	$89.00
Creative Inspire 5700 5.1	$239.00

Gamepad & Harness

Guillemot THRUSTMASTER Fire Storm dual Power Gamepad	$30.00
GearGrip-Pro Computer Harness	$34.00

ABS™ PCs use genuine Microsoft® Windows®
www.microsoft.com/piracy/howtotell

3 Year Limited Parts Warranty / Lifetime Labor Warranty
30 Days Money Back Guarantee
Optional 24 Hours Tech Support Available

ABS

800.639.1470

Please use full URL to get latest prices and special promotions.
www.abspc.com/mp10

Price, specification, and terms are subject to change without notice. Picture shown with upgraded options. ABS™ is not responsible for errors in typography and/or photography. 30 days money back guarantee does not include opened software, parts, or special orders merchandise. Original shipping and handling fee along with return shipping charge are non refundable. Products returned after 30 days or in a non refundable condition are subject to a restocking fee. Intel, Intel Inside, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Copyrighted material

XP-SPECIAL — $ 939

- VIA KT-333 333MHZ DDR 4X AGP MB
- 512MB PC2700 333 MHZ DDR Memory
- 80GB 7200 RPM Ultra ATA 100 Hard Drive
- eVGA nVidia Geforce-4 MX440 64MB W/ TV OUT
- 16X DVD-ROM & 32X10X40 CD-RW
- 3D Wave Sound & 450 Watt Subwoofer System
- **Viewsonic 19" E95 .22MM SVGA Monitor**
- 56K Modem, Floppy Dr, Internet Keyboard & Mouse
- **Aluminum** SX1030 SOHO Server Tower Case 425Watt w/ MOD "See Through Windows" & Neon Light
- 6 Cool Custom Colors to Choose From
- Microsoft Windows XP HOME Edition
- Free First Year On Site Service plus 24/7 Tech Support

AMD Athlon™ XP Processor 2600+[1]	$ 1129	CXA101
AMD Athlon™ XP Processor 2400+[2]	$ 1055	CXA102
AMD Athlon™ XP Processor 2200+[3]	$ 1019	CXA103
AMD Athlon™ XP Processor 2100+[4]	$ 995	CXA104
AMD Athlon™ XP Processor 2000+[5]	$ 965	CXA105
AMD Athlon™ XP Processor 1800+[6]	$ 939	CXA106

TITANIUM GAMER FORCE PRO — $ 1215

- VIA KT-333 333MHZ DDR 4X AGP MB
- 512MB PC333 PC2700 DDR Memory
- 80GB 7200 RPM ULTRA ATA133 Hard Drive
- eVGA nVidia Geforce-4 TI4400 128MB w/ TV OUT & DVI
- 16X DVD-ROM 40X12X48 CD-RW Drive
- Creative Lab Sound Blaster Audigy 5.1 w/ 1394 IEEE
- Creative Cambridge Desk Top Theater 5.1 Inspire 5300 5.1 Surround Sound System
- **Viewsonic 19" E95 .22MM SVGA Monitor**
- 56K Modem & 1.44 MB Floppy Drive
- PS2 Internet Keyboard
- Microsoft Optical IntelliMousel
- **Aluminum** SX1030 SOHO Server Tower Case 425Watt w/ MOD "See Through Windows" & Neon Light
- 6 Cool Custom Colors to Choose From
- Microsoft Windows XP Home Edition
- Corel Wordperfect Office 2002 or MS Work 2000
- Free First Year On Site Service plus 24/7 Tech Support

AMD Athlon™ XP Processor 2600+[1]	$ 1399	CXC101
AMD Athlon™ XP Processor 2400+[2]	$ 1329	CXC102
AMD Athlon™ XP Processor 2200+[3]	$ 1295	CXC103
AMD Athlon™ XP Processor 2100+[4]	$ 1265	CXC104
AMD Athlon™ XP Processor 2000+[5]	$ 1235	CXC105
AMD Athlon™ XP Processor 1800+[6]	$ 1215	CXC106

XTREME GAMER PLATINUM PRO — $ 1649

- VIA KT-400 266MHZ FSB DDR 4X AGP MB
- 1GBMB PC400 PC2700 DDR Memory
- 80GB 7200 RPM Ultra ATA 133 Hard Drive
- eVGA nVidia Geforce-4 TI 4600 128MB DDR Video
- 16X DVD-ROM & 40X12X48 CD-RW Drive
- Creative Lab Sound Blaster Audigy X-Gamer 5.1 w/ IEEE
- Creative Cambridge Desk Top Theater 5.1 Inspire 5300 5.1 Surround Sound System
- **19" Viewsonic E90FB .22MM SVGA Monitor**
- 56K Modem & 1.44 MB Floppy Drive
- Silver PS2 Internet Keyboard
- Microsoft Optical intelli Explorer Mouse
- **CyberTec Professional Aluminum Case 420 Watt w/ 3 See Through Windows & Neon Light [As Shown]**
- Microsoft Windows XP Home Edition
- Free First Year On Site Service plus 24/7 Tech Support

AMD Athlon™ XP Processor 2600+[1]	$ 1839	CD101
AMD Athlon™ XP Processor 2400+[2]	$ 1765	CD102
AMD Athlon™ XP Processor 2200+[3]	$ 1729	CD103
AMD Athlon™ XP Processor 2100+[4]	$ 1699	CD104
AMD Athlon™ XP Processor 2000+[5]	$ 1675	CD105
AMD Athlon™ XP Processor 1800+[6]	$ 1649	CD106

CyberPower Inc.

VISA MasterCard DISCOVER

Price subject to change without notice. •

4802 Little John St. Baldwin Park, CA 91706
Tel: (626)813-7730 • Fax: (626)813-3810
Technical Support (877)876-4965
Hour:Mon-Fri 8:30A.M. ~ 6:00P.M. • Sat 9:30A.M. ~ 3:00P.M.

1 QuantiSpeed™ architecture outperforms competive 2.60GHz processors, QuantiSpeed™ architecture operates at 2.13GHz.
2 QuantiSpeed™ architecture outperforms competive 2.40GHz processors, QuantiSpeed™ architecture operates at 2.00GHz.
3 QuantiSpeed™ architecture outperforms competive 2.20GHz processors, QuantiSpeed™ architecture operates at 1.80GHz.
4 QuantiSpeed™ architecture outperforms competive 2.10GHz processors, QuantiSpeed™ architecture operates at 1.73GHz.
5 QuantiSpeed™ architecture outperforms competive 2.00GHz processors, QuantiSpeed™ architecture operates at 1.67GHz.
6 QuantiSpeed™ architecture outperforms competive 1.80GHz processors, QuantiSpeed™ architecture operates at 1.533GHz.

MSI

nVIDIA. GeForce4 Ti

Copyrighted material

PC-I8

PC-I8X

R08

PANEL PC

PC-V9M2

PC-V9M

PC-V9

PC-KII

CASE DEPOT

www.casedepot.com

CaseDepot.com
Get the Right Case at the Right Price

CaseDepot.com
Get the Right Case at the Right Price

C404 ATX Side Open

51800 ATX Side Open
ANTEC C-1230

41800 ATX Side Open
ANTEC C-10300

4180B ATX Side Open
ANTEC C-1030B

430 Aluminum ATX
Side Open USB

478 Aluminum ATX
Side Open USB

C492 Aluminum ATX
Side Open USB
LIAN-LI C65

4930B Aluminum ATX
Side Open USB
LIAN-LI C61

59200 Aluminum ATX
Side Open USB
LIAN-LI C70

497 Aluminum ATX
Side Open

430 Aluminum ATX
Side Open USB

433 Midtower ATX
Side Open USB

ATX 230-400W

E-MACHINE 145W P.S. $30.00

SS 230-400W

ATT 230-600W

SS SIZE (6x5 1/2x3 3/8)

ATT SIZE (8 3/8 x 6 x 5 7/8)

Price	SS	AT/ATT
250W	35	45
300W	53	65
400W	105	110
500W	N/A	210
600W	N/A	280

ATX POWER SUPPLY MEETS AMD & 2.03 COMPLIANCE (P4 READY/ AMD Certified)

ATX	Price
250W(F)	30
300W(S)	35
350W(M)	65
400W(R)	70
430W(M)	85
460W(Z)	135
550W(M)	150

(RSP/ FAN)
$18
RSP68/FAN,
$48
IDE /SCSI

(RSM/ FAN) 169
$65/75 (wide)
METAL

$15
HD COOLER

Aluminum

$45

Tempguard
DIGIDOC 5
8 PORT $72

PLEASE CALL

800-200-6118

TEAM FORCE CO., INC. *Member of the Better Business Bureau*
16013 Valley View Ave. Santa Fe Springs, CA 90670

All Gov't, Schools, Hospitals P.O. Welcome

Tech Support & Information:

TEL: 562-404-9725 • FAX: 562-404-8525

Business Hours: M-F 8:30-5:00

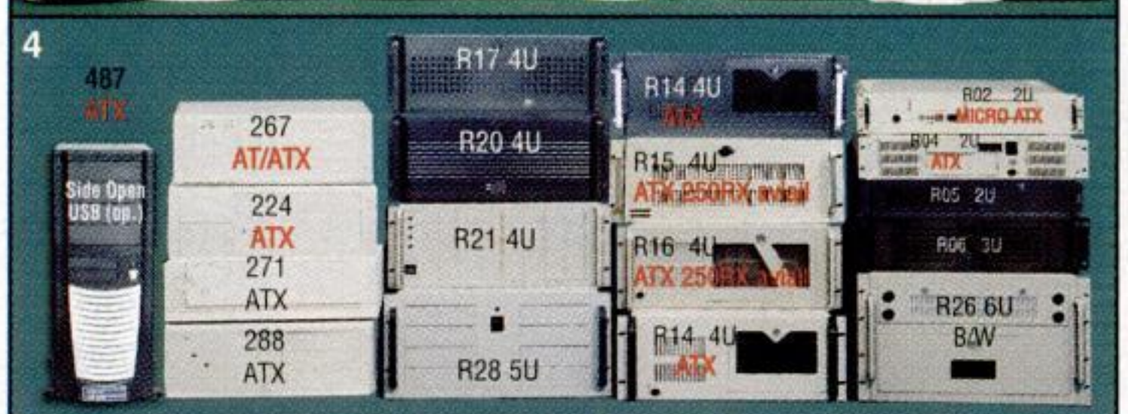
We honor: MasterCard VISA DISCOVER

All prices subject to change without notice. RMA # required on all returns. All trademarks are the properties of their respective owners.

sales@casedepot.com • support@casedepot.com

1
IN-WIN 536 SIDE OPEN ATX SLIDE PLATE
570 ATX SIDE OPEN FILTER FAN
526 ATX SIDE OPEN SLIDE PLATE
562 ATX SIDE OPEN
592 Aluminum LIAN-LI C70 FILTER ATX
563 ATX DOOR LOCK 2 FAN SIDE OPEN
565 XEON/ ATX Side open
582 ATX SIDE OPEN SLIDE PLATE Easy Open
518 ATX SLIDE PLATE SIDE OPEN
571 ATX SIDE OPEN FILTER 2 FANS

3
401 AT/ATX SIDE OPEN FILTER
443 ATX Side Open
Super Power 486 ATX Toolfree side Open
ENLIGHT 424 ATX FAN SCREW LESS
IN-WIN 436 ATX SLIDE PLATE
477BL ATX SIDE OPEN USB
467 ATX FILTER SIDE OPEN SLIDE PLATE
426 ATX SIDE OPEN SLIDE PLATE
487 ATX FILTER FAN SIDE OPEN
470 ATX FILTER SIDE OPEN SLIDE PLATE



MODEL/ SPECS	Bare Bone	Dimension W.D.H	I/O ports	5.25"	3.5"	PCI	PCI ISA
105LPX socket 370	255	12x13x3.1	PS2 KB,mouse,VGA,USB,RJ45.2S,1P,AUDIO, GAME	1	1/1	3 or	0
105LPX TV	275	12x13x3.1	PS2 KB,mouse,VGA,USB,RJ45.2S,1P,AUDIO,GAME,TV	1		3 or	0
1070T	395	5.75x6.2x1.9	PS2 KB,mouse,VGA,USB,RJ45.2S,1P,AUDIO,GAME	1slim	0/1slim	0	0
103M.ATX 370	85	12.75x17.3x4	PS2 KB,mouse,VGA,USB,RJ45.2S,1P,AUDIO, GAME PS2	1	1/1	mini 2 or	0
192 M.ATX 370	185	13.8x16.5x3.4	KB,mouse,VGA,USB,RJ45.2S,1P,AUDIO,GAME	1	1/1	3 or	0
192B M.ATX 370	185	13.8x16.5x3.4	PS2 KB,mouse,VGA,USB,RJ45.2S,1P,AUDIO,GAME	1	1/1	3 &	0

Case Specification & Price List

Model	Dimension W.D.H.	MB Size	5.25 Ext./Int.	3.5 Ext./Int.	P.S.
R02/BARE	19x17.6x3.5	M.ATX	1/0	1/1	150W
R04B/W	19x24.3x3.5	ATX	1/0	1/3	250W
R05B	19x242x3.5	ATX	1/0	1/4	430W
R06B	19x20.2x5.25	ATX	4/0	1/5	300W
R08 B/W	19x22x3.5				
R14 B/W	19x21x7	ATX	3/0	1/3	300W
R15	19x24.4x7	ATX	6/0	2/2	300W
R16 B/W	19x18x7	ATX	3/0	1/2	250W
R17 B 4U	19x21x7	ATX	3/0	1/2	250W
R20 B/W	19x20.5x7		8/0		300W
R21 B/W	19x18x7		8/0		300W
R26R/B/W	19x22.6x10.7	ATX	4/0	2/4	300W/R
R28	19x17x8.7		8/0		300W
RSP	5.8x9.3x1.6			1	
RSM169-100	5.8x9.3x1.6			1	
001B	10x11.5x3		1/0		60W
001B1	8.3x10.6x2.8		1/0		50W
002B	6.9x14.6x5.8		2/0		60W
002B1	7.5x11.2x6.5		2/0		80W
004B	6.8x15.3x9.3		4/0		230W
004B1	7.5x17.3x10.2		4/0		200W
007B	7x15.8x13		7/0		250W
008B	8.4x20.2x18.3		8/0		300W
008B1	7.5x17.9x17.1		8/0		250W
105LPX/TV	11.9x12.6x3	LPX	1/0	1/1	90W
107 bare	5.75x6.2x1.9		1slim/0	0/1slim	
111N bare	11.6x10.6x2.5	M.NLX	1/0	0/1	100W
192M.ATX/B	13.1x16.5x3.5	M.ATX	1/0	1/1	150W
224	17.4x18.8x6.1	ATX	3/0	2/2	300W
267	16.8x16.8x6.2	ATX	2/0	2/1	300W
271	17.3x15.9x5.5	ATX	2/0	1/1	250X
288	16.9x17x6	ATX	3/0	2/1	300W
304	7.9x18.8x13.9	ATX	3/0	2/1	300W
325B	8x18.5x17	ATX	3/0	2/1	250W
338	7x14.7x13.8	M. ATX	2/0	2/1	145W
366	7.2x15.5x14.3	M. ATX	2/0	1/1	250W
367	7.7x16.5x17	ATX	3/0	2/1	250W
370	8.3x17.3x16.1	ATX	3/0	2/2	250W
401	8.5x17.3x18	ATX	2/0	2/2	300W
404	8x18.8x17	ATX	4/0	2/2	320W
405B	7.8x17.5x17.2	ATX	4/0	2/2	320W
409	9.5x22x18.1	ATX	4/0	2/5	300W
411	7.2x17.2x16.8	ATX	4/0	2/1	300W
412	7.2x17.2x16.8	ATX	4/0	1/2	300W
413BL	8.5x19.5x18	ATX	4/0	2/1	300W
415	8.8x19.5x19.7	ATX	8/0	1/0	300W
418B/W	8.1x18.8x21.4	ATX	4/0	2/4	300W
422	7.7x16.6x18.1	AT	4/0	1/4	300W
424	7.5x18.9x16.7	ATX	4/0	2/1	300W
426B/W/S	7.5x17.5x19.3	ATX	3/0	2/2	300W
427	7.5x16.5x17.3	ATX	3/0	2/2	300W
430 BL/BK	8.25x19.75x18	ATX	4/0	3/6	300W
433	7.8x19.7x17.9	ATX	4/0	2/5	300W
436	8.6x18x15.6	ATX	3/0	2/2	300W
443	8x18.8x17	ATX	4/0	2/2	300W
467	7.5x16.7x18.8	ATX	3/0	1/4	300W
470	8.3x17.3x21.3	ATX	4/1	1/2	300W
471	8.4x17.5x21.3	ATX	3/1	1/4	300W
472	7.5x18x17.6	ATX	4/0	2/2	300W
474	7.8x17.2x17.2	ATX	4/0	2/2	300W
476	8x17.2x17	ATX	4/0	2/2	300W
477BL	8.75x17.5x17	ATX	4/0	2/2	300W
478	7.9x18.4x16.4	ATX	4/0	2/1	300W
480	7.8x18x16.5	ATX	4/0	2/1	300W
482B	7.8x19.8x17.5	ATX	4/0	2/2	300W
486	9.6x19.5x17	ATX	4/0	2/1	300W
487B/W	8.25x18.4x21.25	ATX	4/0	2/4	300W
489**	7.3x17x17	ATX	3/0	1/2	300W
492	8.3x19.5x17.6	ATX	4/0	3/5	300W
493B	8.3x19.5x17.6	ATX	4/0	3/5	300W
494	8.3x19.5x17.6	ATX	4/0	3/5	300W
496	8.25x17.8x16.5	ATX	4/0	1/3	300W
501	8.25x17.2x23.8	ATX	4/0	2/4	300W
503R/B	14.8x20.4x18.4	ATX	8/0	2/4	300RW
503/B	14.8x20.4x18.4	ATX	8/0	2/4	300W
505	14.6x23x26.8	ATX	12/0	1/8	300W
505R	14.6x23x26.8	ATX	12/0	1/8	300RW
518	8.1x18.5x26.5	ATX	6/0	2/6	300W
524	13.9x25.6x19.1	ATX	7/0	1/2	300RW
526B/W	7.5x17.5x24.5	ATX	6/0	1/4	300W
528	7.5x16.5x24.8	ATX	6/0	1/5	300W
536	7.8x17x24	ATX	5/0	1/5	300W
560/R	15x24.5x23.5	ATX	11/0	2/4	300W/300R
562/R/B/W	8.7x17.9x26.8	ATX	9/1	1/0	300W/300R
563/RB/W	8.7x17.9x26.8	ATX	10/0		300W/300R
565	9.25x18.3x21.2	XEON/ATX	4/0	2/4	300W
569B/W	13.5x17.8x14	B/ATX	6/2	0/8	300W/300W
570/R	8.3x17.3x26.4	ATX	7/1	1/2	300W/300R
571/R	8.3x17.3x26.4	ATX	6/1	1/2	300W/300R
582	7.8x16.5x23.2	ATX	6/0	2/1	300W
588	7.8x16.5x23.3	ATX	5/0	1/3	300W
592	8.2x23.5x23.5	ATX	6/0	3/6	300W
1620/R	16.5x20.3x34.3	F/ATXx2	16/0		300R

FOR ALL THE PRICE ON ABOVE ITEMS PLEASE TO TO: WWW.CASEDEPOT.COM

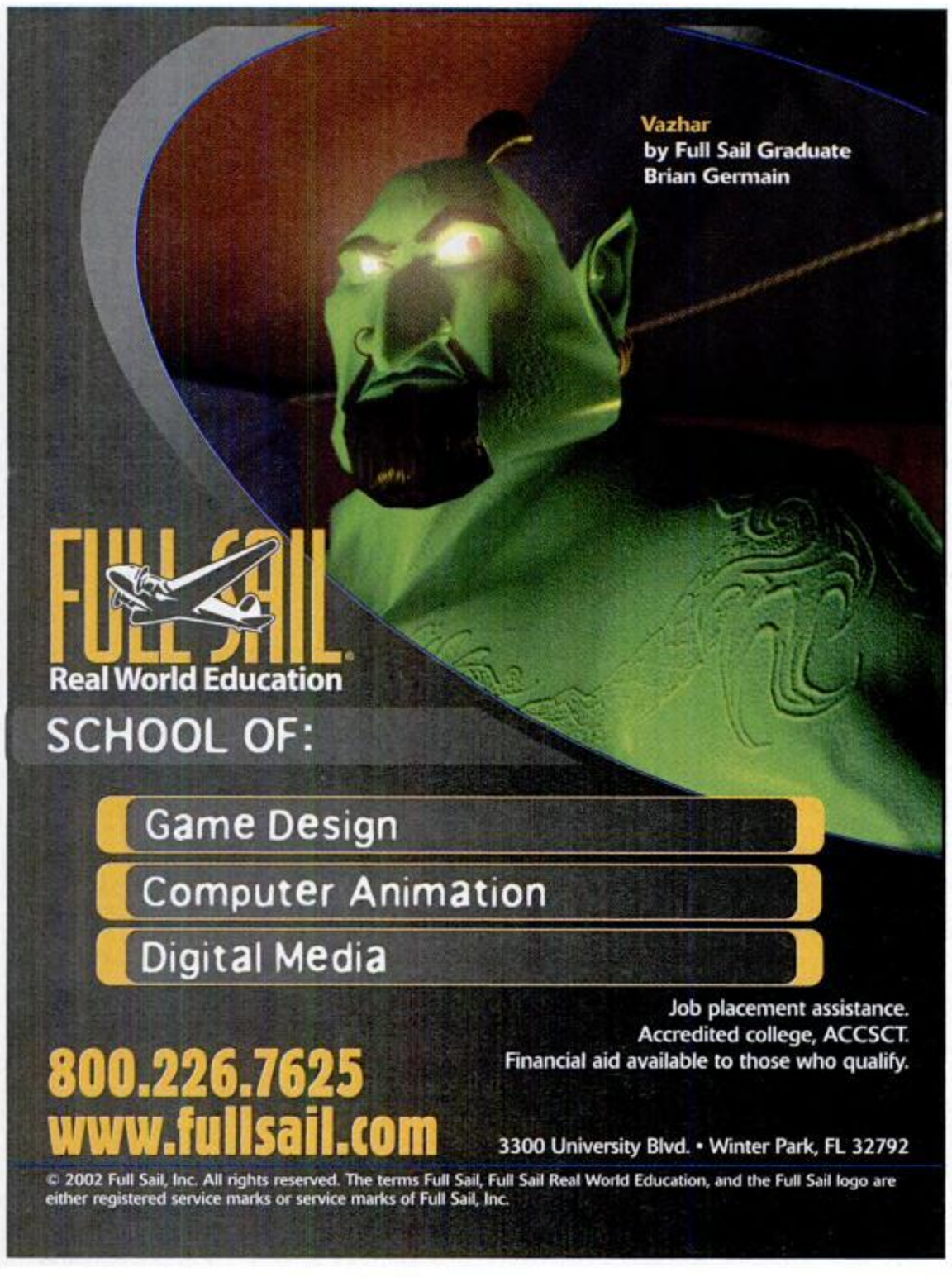
Model# Starts with:
1 for Slim Case
2 for Desktop Case
3 for Mini-Mid Case
4 for Mid Case
5 for Full/File Server Case
Side Open: Side Panel can be removed independently
Slide Door: Sliding front door up and down
Slide MB Plate: Motherboard tray can slide in and out from rear

*Case Color: Blue, Purple, Green, Orange, Red.

**Case Color: Blue, Purple, Green, Red, Black.

MB SIZE = MOTHERBOARD SIZE • F= FULL SIZE • B= BABY SIZE
X=ATX • M. ATX= Micro ATX
R= REDUNDANT POWER SUPPLY WITH HARDSWAP

Copyrighted material



FULL SAIL
Real World Education

SCHOOL OF:

- Game Design
- Computer Animation
- Digital Media

Job placement assistance.
Accredited college, ACCSCT.
Financial aid available to those who qualify.

800.226.7625
www.fullsail.com

3300 University Blvd. • Winter Park, FL 32792

© 2002 Full Sail, Inc. All rights reserved. The terms Full Sail, Full Sail Real World Education, and the Full Sail logo are either registered service marks or service marks of Full Sail, Inc.

Become a
PC Repair Technician
with at-home training

By learning at home to maintain and repair PCs, you can earn up to $48,000 a year.* And you'll be in high demand in this growing field — there are expected to be 14% more job openings for trained PC Repair Technicians by 2010.**

With Education Direct, all learning materials and equipment are shipped to your door, and you learn in the comfort and privacy of your own home. Step-by-step lessons make learning easy but, if you have questions, you'll get unlimited help from instructors who are available by phone or e-mail.

For FAST & FREE information with no obligation,
Call **1-800-572-1685, ext. 3029**
or visit **www.EduDirect-usa.com** Enter ID# AFYSA2S. or simply return the coupon below.

V325

*All salary information is based on the *Occupational Outlook Handbook*, a publication of the U.S. Department of Labor. Individual student earnings vary.

**Growth figures represent a ten-year period ending 2010. Source: *National Industry-Occupation Employment Matrix*, a publication of the U.S. Bureau of Labor Statistics.

THOMSON EDUCATION DIRECT
Dept. AFYSA2S
925 Oak Street, Scranton, PA 18515-0700

Send For Free Facts!

Yes, I want free information on at-home career training for the program I've checked below. I understand there is no obligation. (Please check only one program.)

- ☐ **27 PC Repair**
- ☐ 64 Applied Computer Science (Associate in Specialized Business Degree)
- ☐ 38 PC Specialist
- ☐ 43 PC Fundamentals*
- ☐ 105 Computer Graphic Artist
- ☐ 36 Visual C++® Programmer
- ☐ 37 Visual Basic® Programmer
- ☐ 82 Java® Programmer
- ☐ 83 Web Page Designer
- ☐ 44 A+® Certification Test Prep*

*Certificate Programs

Name _____
Street _____ Apt# _____
City _____ State _____ Zip _____
Phone ( ) _____ E-mail _____

Let Nothing Come Between You & Your Audio

WIRELESS TRANSFER
From *ANY* Audio Source

MP3 Player
CD Player
Satellite Radio
Computer Audio

To *ANY* FM Radio

- Full Stereo on any FM Frequency
- 4 Hz - 16.5 kHz Frequency Response
- Exceptionally Clean Signal with Drift-Free PLL Digital Tuning
- Car Kit Available for Mobile Use

FREE CATALOG
1-800-522-8863 • ccrane.com

FM TRANSMITTER
C.CRANE

Copyrighted material

MEMORY

DESKTOP-LAPTOP-CAMERA-PRINTER

WE CAN BEAT ANY PRICE, ANYWHERE

CALL AROUND...THEN CALL US!!!

"NOBODY CAN BEAT US...NOBODY"

LIFETIME WARRANTY-NEVER A RE-STOCKING FEE

1-800-4-MEMORY

WWW.18004MEMORY.COM

ADVERTISE IN THE MAXIMUMPC MARKETPLACE AND WATCH YOUR SALES SKY ROCKET!

FOR MARKETPLACE SALES CONTACT SHARON KIERNAN

(781) 416-2018

ZALMAN

Zalman Noiseless Coolers

Intel Pentium 4 (478)
AMD Athlon XP (462) **Silent**

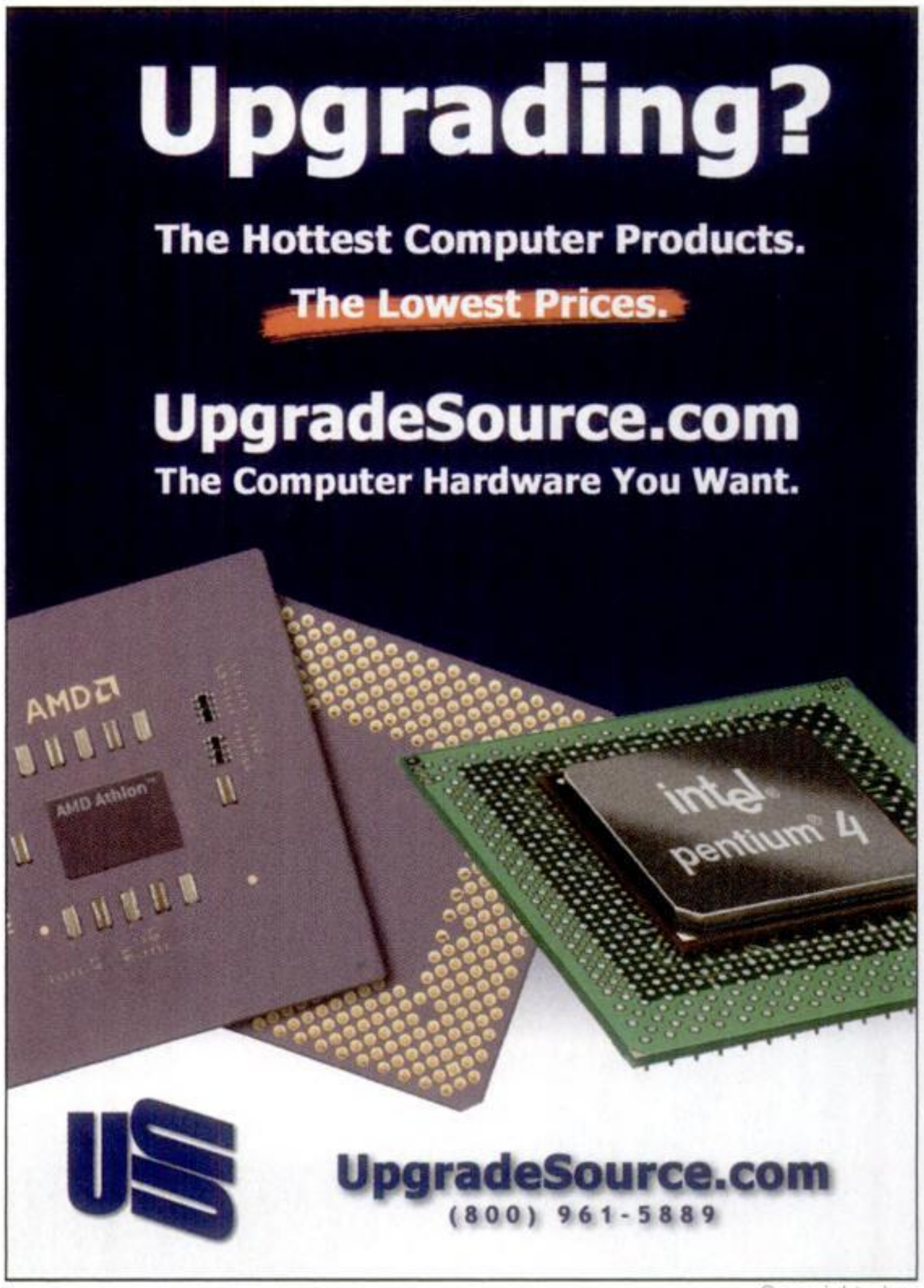
- Zalman CPU Coolers generate little noise and vibration in Silent Mode.
- The heat dissipating material of the Flower HeatSink (FHS) is 100% Pure Aluminum or Copper.
- CPU can be cooled sufficiently below the temperature required by the CPU manufacturer in Silent Mode.
- Zalman CPU Coolers allow very stable operation of CPUs in an OVERCLOCKED environment.

CPU Coolers

Other Products

Zalman Tech Co., Ltd. (www.zalman.co.kr)
Tel : 82-2-2107-3232 Seoul, Korea

Zalman USA, Inc. (www.zalmanusa.com)
Tel: 714-693-8880 1565 Harmony Circle, Anaheim, CA 92807



Copyrighted material

QuickTech

Professional PC Diagnostic Tools
Professional

QuickTech Professional, Ultra-X's professional-level PC diagnostic software program, is designed to meet the demanding and ever-changing needs of system developers and integrators, OEM's, technicians, MIS professionals, and end users who want to quickly test and troubleshoot core system components, functions and peripherals.

Quick. Simple. Accurate.

Don' t take our word for it, Hear what others have to say...

After having used several other software diagnostic utilities, including commerial and shareware, we can honestly say that this one is the best of all we have tried.
Dean Kent
Real World Technologies

*This one **could serve as a model for all PC diagnostic tools**-fast, small, OS-independent,easy to run, and quick to provide detailed and useful output.*
Maximum PC Feature February 2002- "Heal your PC!" by Robert Luhn

Win the Race Against Downtime!

Features:

- O/S Independent Self Boot
- Customizable Burn-In
- System Board Testing & Analysis
- Critical RAM Testing
- IDE/ATAPI Testing
- LPT, COM, & USB Port Testing
- Video, Modem, & Sound Card Testing
- & Much More!

Fully Tests ALL Types of Memory

- SDRAM PC-66-133-150
- ECC & Parity
- DDR / DDR-II / DDR- 333 [New]
- RDRAM(RAMBus)-PC600/800/1200 [New]

Kit Includes:

- QuickTech Professional
- QuickTech Personal
- LPT & COM Port Loopbacks
- Blue Professional Carrying Case

ULTRA-X, INC.
www.uxd.com
For more information:
1-888-722-3734
FAX: 1-909-946-7639
Email: sales@uxd.net

Sharka Corporation

Providers of Quiet & Extreme Cooling Solutions

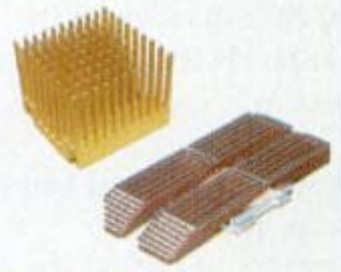
distributor of **ZALMAN** cooling products

Flower CPU Coolers

Radial CPU Coolers

Quiet Power Supplies

Chipset Heatsinks



other products include:

Case Mods

Water Cooling

www.sharkacorp.com

Your Complete Store For:

- Quiet CPU Cooling
- Case Modifications
- Compounds / Adhesives
- Fans / Fan Accessories
- Hard Disk Drives
- Noise Reducers
- Power Supplies
- Rounded Cables
- VGA / Chipset Heatsinks
- Water Cooling
- System Configurator
  - Quiet PCs
  - Workstations
  - Servers

For More Information:

tel: 1.949.582.3143
fax: 1.949.582.2217
email: info@sharkacorp.com
www.sharkacomputers.com
www.quietcooling.com
www.pcmodtoys.com

CrazyPC

www.crazypc.com

Cooling, Case Mods, Game Gear

1-888-558-6005

CPU Coolers
High Performance

Dr. Thermal
TI V77L
$ 19.95

MCX-4000B
$ 41.95
P4 socket 478

HDD Coolers

Aluminum w/Dual Fan
$14.95

Chip Coolers

GeForce4
Copper
$19.95

BGA RAM Sinks
$12.95

Fans

Tornado
80x38mm, 84CFM
$17.95

YS Tech TMD Fans
$12.95

Etched Windows

$34.95

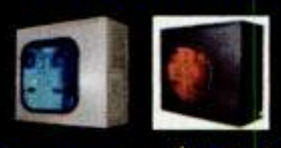
Lazer LEDs

$19.95

Fan Guards

80mm
$13.95

Window Kits



Round	$15.95
Oval	$15.95
Square	$16.95

Cold Cathode Light Kits

$24.95

Xbags

$43.95

Power Supplies

$94.95

EG465P-VE FCA
Fan Control Adjustable

Cables/Wires

IDE Round Cables
$8.95
and lower!

Mobile Racks

EZ Swap - alum. LCD Alarm
$37.95

KF102 - Alum. 2 Fans
$25.95

Cases

Biohazard Case - $200
Aluminum Mid-Tower, USB
Laser Cut Window, 4 Fans

KWI KT-436B-WM - $179.95
Aluminum Mid-Tower
Three Windows, USB, Firewire

Lian-Li PC-61
Aluminum Mid-Tower, USB, Laser Cut Window, 4 fans
$140.95

Lian-Li PC-50
Aluminum, Top Fan, USB Ports
$108.95

Imperial
4x5.25", 3x3.5"ext, 3x3.5" int, temp fan control
$59.95

Lian-Li PC-70
Aluminum Full Tower, USB Ports, 6x5.25"ext., 3x3.5"ext, 6x3.5"int.
$204.95

Copyrighted material

MAXIMUMPC Rig of the Month

THIS MONTH: Nick Pelis's Caffeine Machine

An auxiliary hot plate keeps a second carafe warm.

Sometimes your PC isn't all that needs a reboot. Indeed, the lifeblood of many a power user is caffeine, and we just discovered one guy who figured out how to keep himself wired without ever getting up from his computer desk. Driven by a love of the black brew and a desire to push the boundaries of case modding, Nick "Wixx" Pelis embarked on an endeavor that lasted "months and months" and culminated in the spectacle featured here.

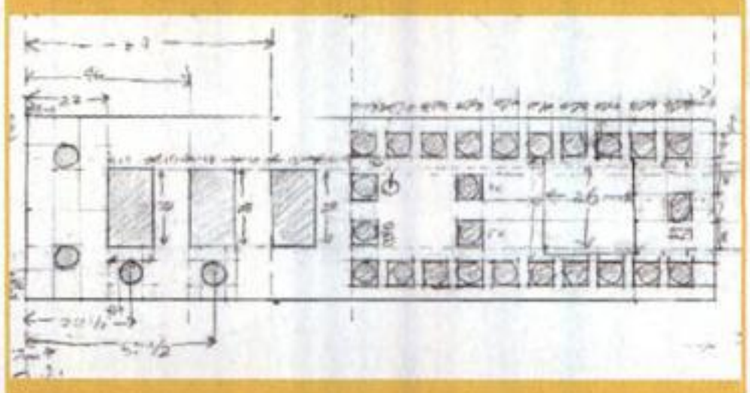
MPC: What were the biggest challenges you encountered in building this hybrid home appliance?
Although I had a good idea of what it was going to look like before I started, it still took a lot of research, measuring, and blueprinting before I finally found a case that was big enough, a coffee maker that was small enough, and a way to piece it all together into one unit. The next challenge came in figuring out the electrical systems. I wanted to make The Caffeine Machine both safe to use and remote controlled, so I spent a few days looking at fuses and relays, then designing circuits to achieve the functionality I wanted. The scary part was plugging the device in for the first time and immediately blowing the fuse because I had grossly underestimated the power consumption of the coffee maker.

MPC: Does the additional heat created by the coffee maker require special cooling?
Considering it takes just seconds for the hot plates to boil room-temperature water, I was concerned the whole project might disappear in a flash of flame and light. To counter this, I installed a 120mm cooling fan on the bottom and top, with the air blowing over the back plate of the coffee maker. One idea was to use the CPUs to heat the water, but the dual P-IIIs don't generate enough heat quickly enough to satisfy a five-minute brewing time.

MPC: What about a patent? We can imagine this machine being sold at Starbucks.
I'm actually in the process of getting the thing patented—not to sell, mind you, but just to protect the idea. I encourage others to try this mod as well, and a walk-through is available at PimpRig.com.

MPC: Where did you get your knowledge of electricity?
Electronics has always been a side interest of mine. When I was a little kid, I used to go to the dump with mom and dad and scrounge around amongst the refuse and pick up the junked TVs and stereos other people would throw away, then take them back home and fabricate evil creations.

Bezel blueprint: "Cutting out the front for the coffee maker required redesigning the front bezel, so I added lights for hard drive activity as well as network activity."



MPC: Do you drink your coffee black, or did you have to make accommodations for cream and sugar?
You won't find any triple mocha latte enemas here, and there's no cream or sugar. I drink coffee for the caffeine and the caffeine only.

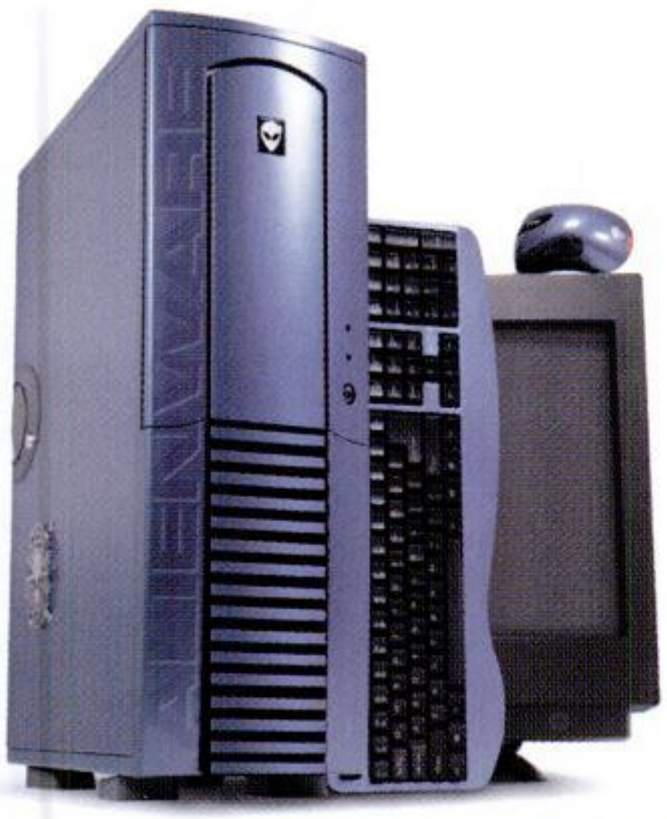
If you have a contender for Rig of the Month, e-mail **input@maximumpc.com** with pics and a brief write-up.

Copyrighted material

"The Area-51 is simply the fastest PC we've ever tested."

- Maximum PC

MAXIMUM PC KICK ASS PRODUCT



AREA-51™ DESKTOP GAMING

Intel® Pentium® 4 Processor at 2.8GHz with 533 FSB and 512KB Advanced Transfer Cache
High-Performance Heatsink/Cooling System
Intel® 850E Chipset Motherboard
512MB PC-1066 RDRAM
Black Floppy Drive 1.44MB
200GB 7200RPM Ultra ATA100 Hard Drive 8MB Cache
ATI® RADEON™ 9700 PRO 128MB DDR
Koolmaxx™ Video Cooling System
Sound Blaster® Audigy™ Gamer 5.1 Sound Card
16X/48X DVD-ROM Drive
PlexWriter 40X/12X/40X CD-RW IDE
Black Dragon Full-Tower ATX Case
Enermax EG651P-VE 550-Watt Power Supply
Black Microsoft® Internet Keyboard
Black Microsoft® Intellimouse Explorer 3.0
Intel® PRO/100 S Network Adapter
Microsoft® Windows® XP Professional
1-Year Toll-Free 24/7 Technical Support
with Aliencare On-Site Home Service
AlienAutopsy: Automated Technical Support
Personalized Owner's Manual
FREE Exclusive Alienware® T-Shirt
FREE Custom Alienware® Mouse Pad
Optimized & Configured for High-Performance

$3,199.00

Award-Winning Systems

With an Alienware® system, PC gaming is taken to a new level unmatched by standard PC systems. Alienware® systems are available in many custom colors and with the most advanced graphics rendering hardware available and intense theater quality sound. Our systems will leave you wondering why you ever played games on anything else.

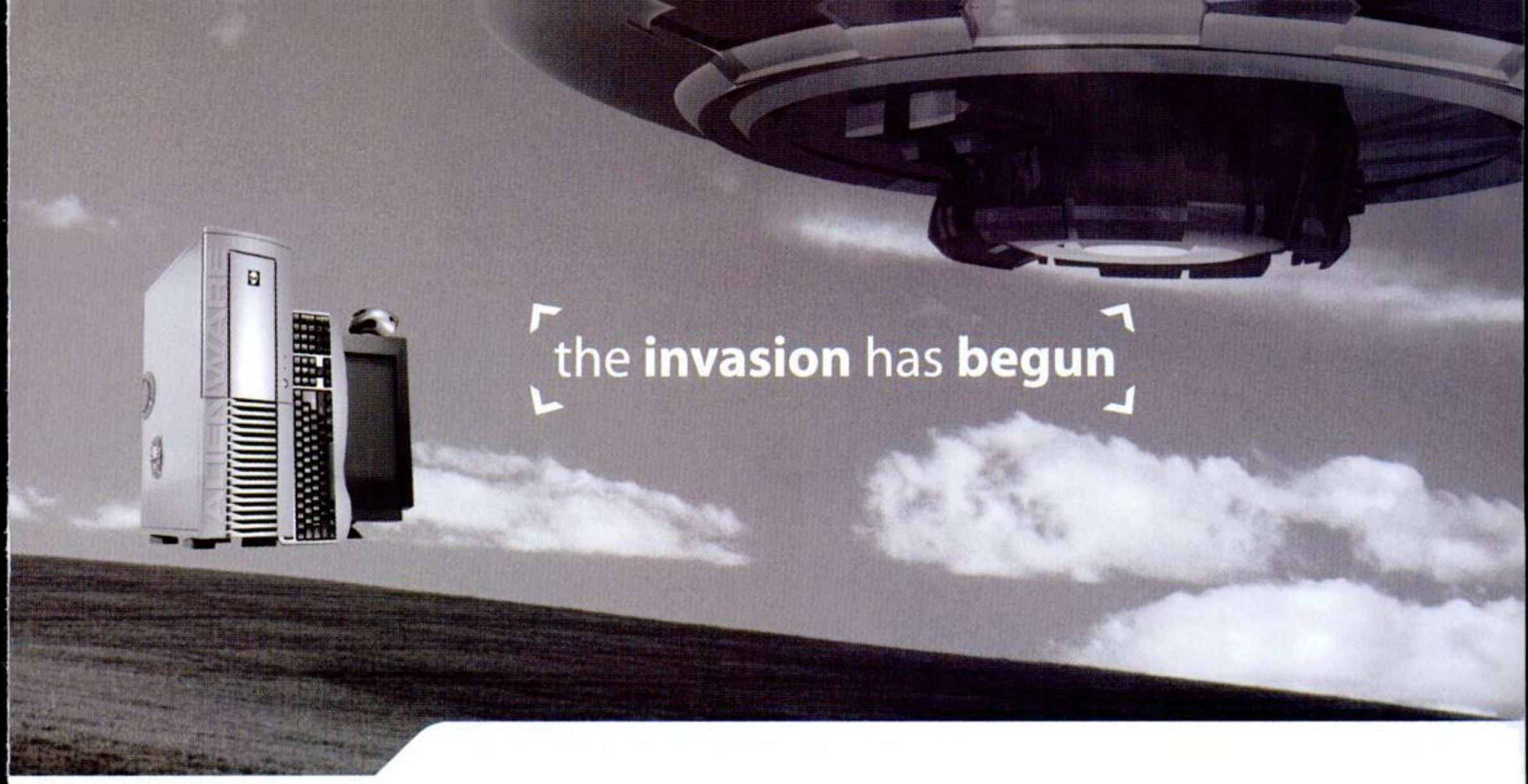
Now Shipping with the
ATI® RADEON™ 9700 PRO 128MB DDR and
ATI® Mobility RADEON™ 9000 PRO 64MB DDR

Desktops available in custom metallic colors!

PC GAMER EDITORS' CHOICE · COMPUTER GAMING WORLD ★★★★★ · COMPUTER GAMING WORLD EDITORS' CHOICE · NextGen ★★★★★ · MAXIMUM PC KICK ASS PRODUCT · Computer Games EDITOR'S CHOICE · cnet Editors' Choice · ZDNet BEST BUY · PC WORLD TOP 15

Alienware® recommends Microsoft® Windows® XP.

Copyrighted material



HIVE-MIND™ DESKTOP GAMING

Intel® Pentium® 4 Processor at 2.26GHz
533 FSB and 512KB Advanced Transfer Cache
High-Performance Heatsink/Cooling System
Intel® 845E Chipset Motherboard
512MB PC-2100 DDR SDRAM
Black Floppy Drive 1.44MB
60GB 7200RPM Ultra ATA100 A/V Drive
NVIDIA® GeForce4™ Ti 4200 64MB DDR
Koolmaxx™ Video Cooling System
Sound Blaster® Audigy™ 5.1 Sound Card
16X/48X DVD-ROM Drive
Black Dragon Full-Tower ATX Case 340-Watt PS
Black Microsoft® Internet Keyboard
Black Microsoft® Intellimouse Explorer 3.0
Intel® PRO/100 S Network Adapter
Microsoft® Windows® XP Professional
1-Year Toll-Free 24/7 Technical Support
with Aliencare On-Site Home Service
AlienAutopsy: Automated Technical Support
Personalized Owner's Manual
FREE Exclusive Alienware® T-Shirt
FREE Custom Alienware® Mouse Pad
Optimized & Configured for High-Performance

$1,599.00

MJ-12™ WORKSTATION

Dual Intel® Pentium® 4 Xeon Processors at 2.4GHz
with 512KB Advanced Transfer Cache
High-Performance Heatsink/Cooling System
Supermicro® Intel® i860 Chipset Motherboard
1024MB NON-ECC PC-800 RDRAM
Black Floppy Drive 1.44MB
180GB Ultra160 SCSI Hard Drive 16MB Cache
NVIDIA® Quadro4™ 900 XGL 128MB DDR
Koolmaxx™ Video Cooling System
Sound Blaster® Audigy™ 5.1 with SB1394™
16X/48X DVD-ROM Drive
Plexwriter 40X/12X/40X CD-RW IDE
Black Xeon EATX Case 420-Watt PS
Black Microsoft® Internet Keyboard
Black Microsoft® Intellimouse Explorer 3.0
10/100Base-T Network Adapter
Microsoft® Windows® XP Professional
1-Year Toll-Free 24/7 Technical Support
with Aliencare On-Site Home Service
AlienAutopsy: Automated Technical Support
Personalized Owner's Manual
FREE Exclusive Alienware® T-Shirt
FREE Custom Alienware® Mouse Pad
Optimized & Configured for High-Performance

$5,899.00

The Alienware® Difference

- Built by Skilled Alienware® Technicians
- Stringent 200-point Quality Control Process
- Fully Upgradeable with No Proprietary On-board Components
- The Most Advanced and Personalized Online Customer Support Available
- **AlienAutopsy: Automated Technical Support Request System**

NEC MONITORS

19" NEC 95F	Flat CRT	$299.00
19" NEC FE991SB	Flat CRT	$389.00
22" NEC FE2111SB	Flat CRT	$759.00
18" NEC 1850X	LCD	$1229.00
20" NEC 2010X	LCD	$1779.00

KLIPSCH SPEAKERS

Klipsch ProMedia 2.1	200-Watt THX-Certified	$179.00
Klipsch ProMedia 4.1	400-Watt THX-Certified	$249.00
Klipsch ProMedia 5.1	500-Watt THX-Certified	$399.00

FOR A LIMITED TIME ONLY!

ALIENWARE® MICE

$59

Available in many Custom Colors!

Visit us at www.alienware.com/gearshop

Intel, Intel Inside Logo, and Pentium are registered trademarks of Intel Corporation.
Prices, configurations, and availability may change without notice.

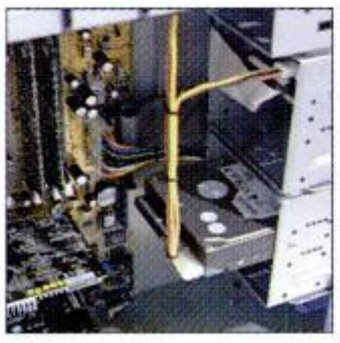
Alienware® recommends Microsoft® Windows® XP.

Copyrighted material

Under the Hood

At Alienware® our selection of components is just as important as building the actual system. We do not use any proprietary components and every single item we put inside the case is guaranteed to be the highest quality component available at that time. Simply put, our computers are the best systems available.

"Alienware's new Area-51 is the absolute fastest PC ever to grace our workbench."
- PC Gamer



Incredible Attention to Detail

Every Alienware® system undergoes a 200-point quality control process. During this process every wire is neatly secured and routed as to not interfere with proper air flow within the chassis. Every system that leaves our factory is regarded as a work of art, hand built by technicians who take enormous pride in their work.

"Computer Gaming World's Ultimate Gaming Champion!"
- Computer Gaming World

"There can only be one. The winner is clearly Alienware!"
- Computer Games

Is Beauty Only Skin Deep?

What good is a beautiful interior without a complementary exterior? Alienware® systems are available in a variety of intense custom colors. This includes cases, mice, keyboards, monitors, and even speakers. The stunning metallic finish of your new Alienware® system is enough to turn anyone green with envy!

"...justifies its name with out-of-this-world speed."
- CNet

Is There Life Beyond Gaming?

So how does a system built for gaming perform in other tasks? The most demanding tasks a computer system can perform are those which involve complex graphic and video calculations. As a result, a system built for gaming performs above and beyond any standard system's expectations.

"Unbeatable for all types of applications, even video encoding."
- Computer Shopper

"...tweaked and tuned for high-performance and reliability..."
- The New York Times

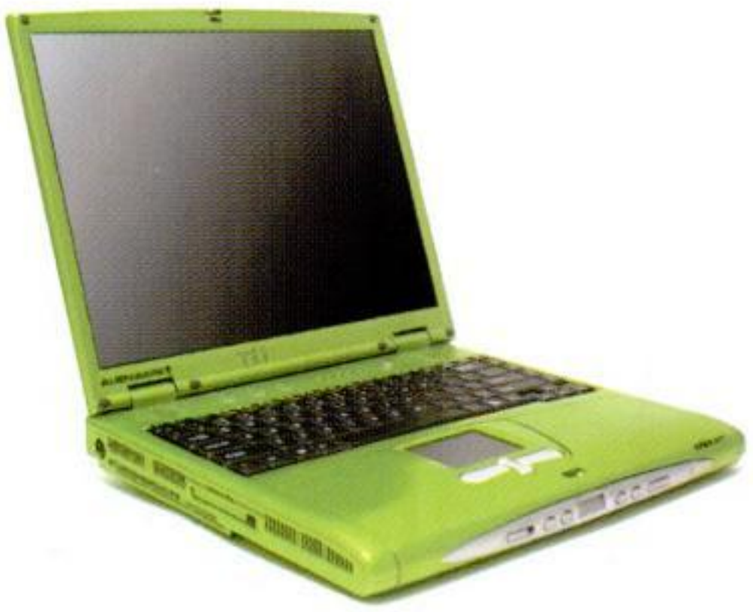
Custom Build your Dream Machine at **WWW.ALIENWARE.COM**

Copyrighted material

"The mobile Alienware is the fastest notebook we've ever tested."

- Maximum PC

MAXIMUM PC KICK ASS PRODUCT



Area-51m™: Mobile Gaming

The Area-51m™ represents the first fully capable mobile gaming solution. The performance requirements of today's most cutting edge games have been simply too demanding for a laptop unit, until now. The Area-51m™ plays games at blistering speeds, handles quick motion with incredible accuracy, and performs phenomenally high in benchmarks. Perfect for LAN parties and for those who simply cannot part from their desktop system's performance, the Area-51m™ is the ultimate mobile gaming machine.

AREA-51m™ MOBILE GAMING

Intel® Pentium® 4 Processor at 2.8GHz 533 FSB and 512KB Advanced Transfer Cache
High-Performance Heatsink/Cooling with Arctic Silver III
Intel® 845MP+ ICH3M Chipset Motherboard
512MB PC-2100 DDR SDRAM
Exclusive Metallic Cyborg Green Laptop Chassis
40GB ATA100 5400RPM Hard Drive
15.0" UltraXGA+ TFT Active Matrix LCD
ATI® Mobility RADEON™ 9000 PRO 64MB DDR with Dual-View Display Monitor and TV-out
Removable 3.5" Floppy Drive
Removable 24X/10X/24X CD-RW/8X DVD Combo Drive
Sound Blaster® Compatible with Wavetable
5.1 3D Surround Sound with S/PDIF Digital Output
Front Panel Audio DJ CD Player
Allows CD Play While System is On or Off
One Type II PCMCIA Slot
Four USB Ports and One IEEE 1394 Port
Infrared Wireless Fast IR Interface
10/100Mb Ethernet LAN and 56K Modem
Dimensions: (H) x (W) x (D) : 1.7" x 13" x 11.4"
Weight: 7.6lbs. without battery
Exclusive 120-Watt A/C Adapter
Microsoft® Windows® XP Professional
1-Year Toll-Free 24/7 Technical Support with Aliencare On-Site Home Service
AlienAutopsy: Automated Technical Support
Personalized Owner's Manual
FREE Exclusive Alienware® T-Shirt
FREE Custom Alienware® Mouse Pad
Optimized & Configured for High-Performance

$2,899.00

Laptops available in custom metallic colors!

ALIENWARE®

Custom Build your Dream Machine at **WWW.ALIENWARE.COM**
For More Information Call Toll-Free: 800.494.3382

Alienware® recommends Microsoft® Windows® XP Professional for Mobile Computing.

Copyrighted material